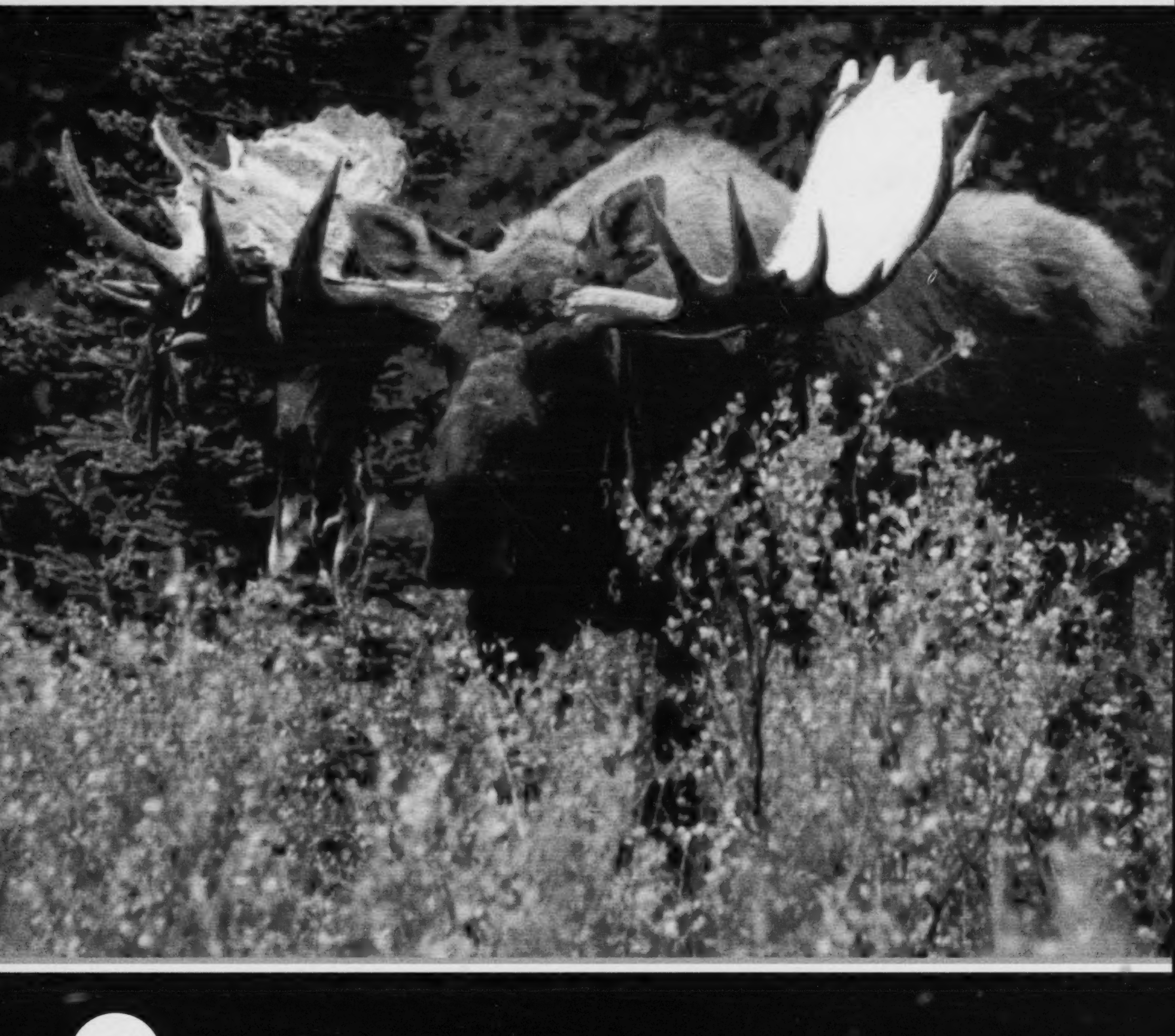
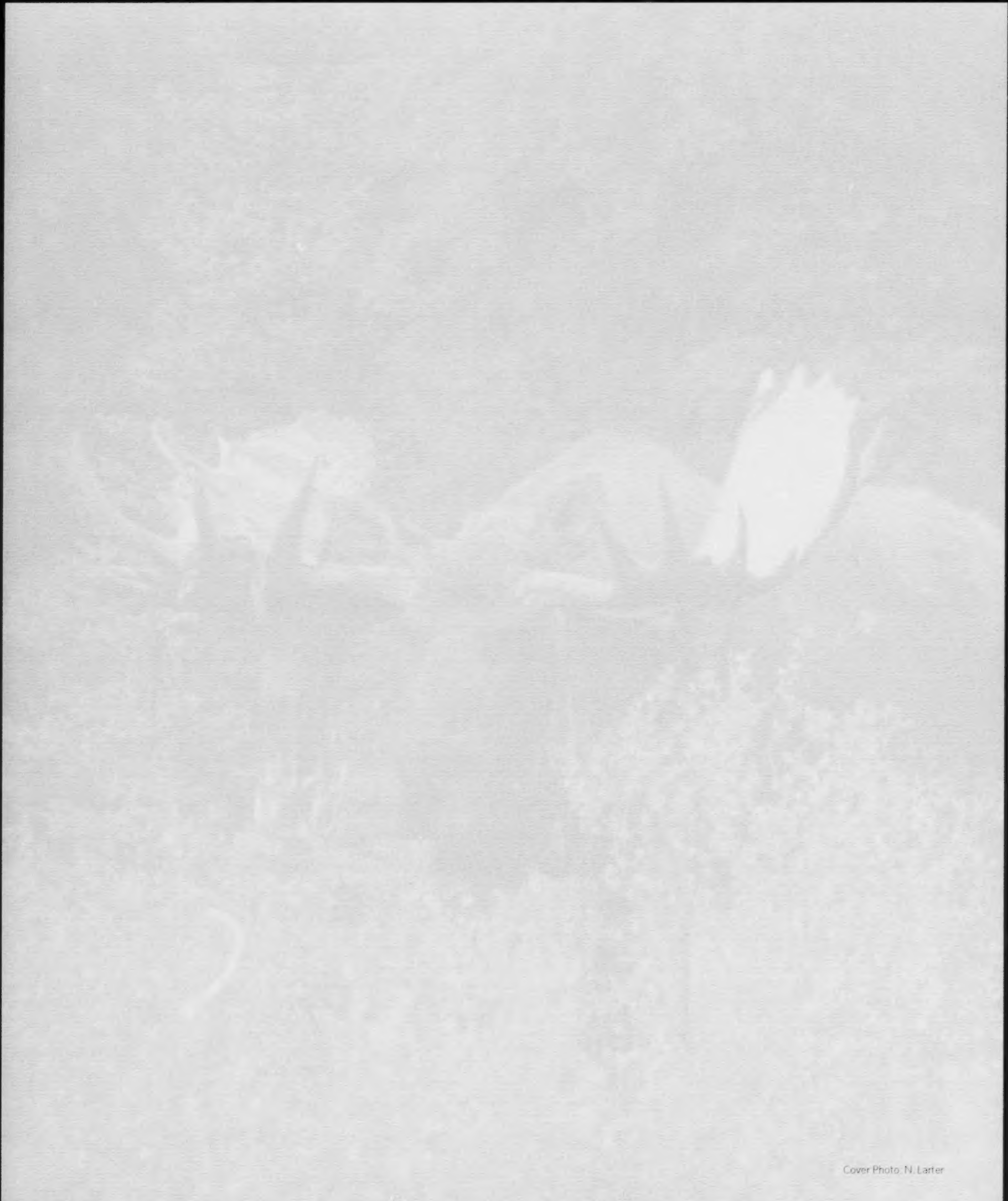
Annual Report of

NWT Wildlife Research Permits

2011



Northwest Territories Environment and Natural Resources



Cover Photo: N. Larter

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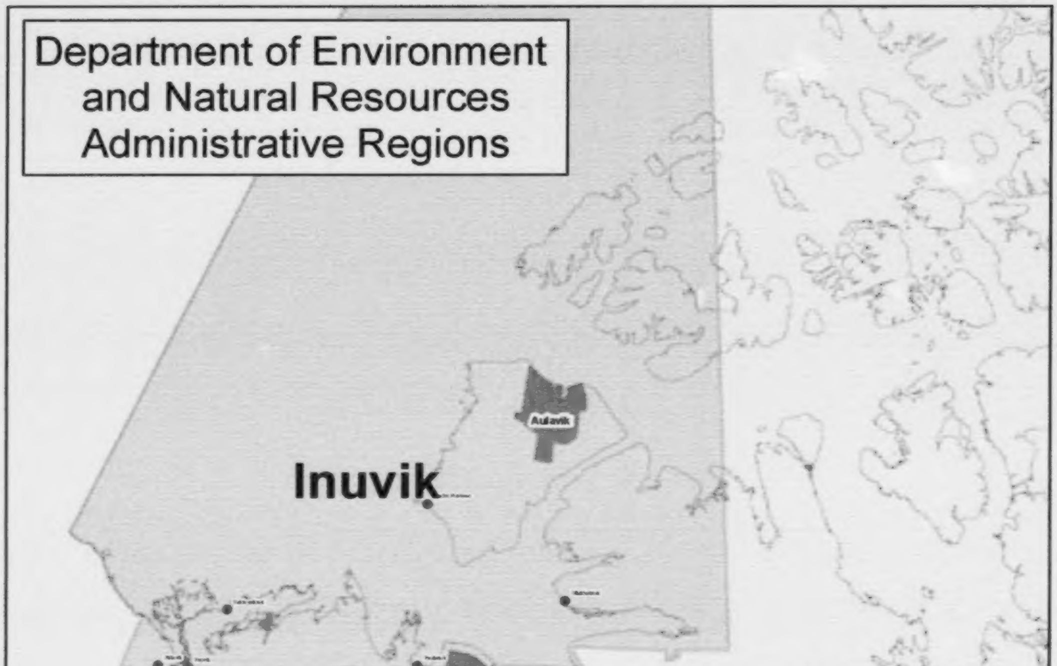
Department of Environment and Natural Resources Administrative Regions
Aulavik
Inuvik
Tuktut Nogait
Sahtu
North Slave
Dehcho
Nahanni
South Slave
Wood Buffalo

NORTHWEST TERRITORIES

Photo: B Ossenburg

2011-2012
Wildlife Research Permits

Under the *Wildlife Act* (section 24), a valid Wildlife Research Permit is required to study wildlife or wildlife habitat in the Northwest Territories (NWT). It is an offence to conduct a survey or census of wildlife or wildlife behaviour, administer drugs, collect or purchase specimens, or carry out any scientific research relating to wildlife without a permit.

The Department of Environment and Natural Resources (ENR) is responsible for issuing Wildlife Research Permits. Each year, researchers carry out studies on all types of wildlife and wildlife habitat, throughout the NWT. As a requirement of an NWT Wildlife Research Permit, researchers must submit a summary report of their activities and findings to ENR. These summary reports are published each year in an annual report.

This publication provides summary reports for the wildlife research carried out during 2011. Contact information for the main investigator leading each project has been included if you wish to obtain more information on a specific project. For more information on Wildlife Research Permits, please go to www.enr.gov.nt.ca or contact your local Environment and Natural Resources office.

The contents of each summary are the sole responsibility of the team leads for each project and do not reflect any official policy of ENR or the Government of the Northwest Territories (GNWT).

Swarming Survey of Bats Near Wood Buffalo National Park

SEPTEMBER 2010 TO MARCH 2011

MAIN INVESTIGATOR:

Dr. Cori Lausen, Independent Research Biologist, Bat Specialist

WILDLIFE RESEARCH PERMIT NUMBER:

WL004812

LOCATION:

The study took place in the Fort Smith area, around Wood Buffalo National Park (South Slave Region).

PARTNERS:

- Parks Canada
- Environment and Natural Resources (GNWT)
- Birchdale Ecological Ltd.

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RATIONALE:

Little is known about bat diversity in the Northwest Territories (NWT). One of the four main bat hibernacula known in Alberta is in Wood Buffalo National Park (WBNP). It was thus hypothesized that bats also hibernate in NWT areas around WBNP.

OBJECTIVES:

- To locate bat hibernacula; and
- To determine what species of bats are still present in NWT in mid-September, during the mating period just prior to hibernation.

METHODS:

We used information from local residents regarding potential bat hibernacula in caves, and investigated these areas. Using mist nets for bats captured, and bat detectors to record ultrasounds we inventoried the general area to determine species diversity at this time of year.

RESULTS AND MAIN CONCLUSIONS:

We determined that there are three species of bats that overwinter in this region of the NWT: big brown bat *(Eptesicus fuscus)*, little brown myotis (*Myotis lucifugus*), and northern myotis (*Myotis septentrionalis*). We located one major hibernaculum, containing approximately 3,000 individuals (almost exclusively males). Captures in the vicinity of this cave were of all three species, but internal observation was only of little brown myotis. There are many fissures inside this cave that could be used by big brown bats and northern myotis, and thus these species may also be hibernating in this cave, but they were not visible.

The bat hibernaculum located during the study is the largest bat hibernaculum currently known in western Canada.

LONG-TERM PLANS AND RECOMMENDATIONS:

The following recommendations are made regarding the South Slave Region and the surrounding WBNP area:

Acoustic monitoring year-round along Highway 5 in WBNP to determine if this highway is a migration route for bats in the spring and/or fall. Simultaneous monitoring along the Slave and Peace Rivers may also illustrate patterns of bat migration especially that of the tree-roosting bats (hoary, red and silver-haired) that are likely to move out of the area by late summer.

Summer bat surveys (acoustic and capture). It would be especially interesting to determine whether big brown bats reside in the area during summer given its absence from the Fort McMurray / Fort McKay areas to the south of WBNP.

Monitoring of the hibernacula described in this survey, including regular annual or biennial inspections (counts and checking for signs of White-Nose Syndrome). Acoustic monitoring year-round would be informative to understand patterns of use. Periodic mist netting would allow for patterns of use by species and sex to be known. Continuous population estimates will be needed to monitor this hibernaculum as White-Nose Syndrome moves west; this disease has proven to be especially devastating to little brown myotis and northern myotis populations in eastern North America.

Monitoring of microclimate (temperature and relative humidity) in both cave hibernacula, for comparison with each other and with future hibernacula, or to use in predicting use of other sinkholes/caves by hibernating bats.

Radio tracking in early fall to locate new hibernacula. Big brown bats are larger and can therefore carry larger transmitters, which last longer and are stronger, therefore more likely to be detected from airplane. This may lead to finding mixed species hibernacula.

Locate local *Myotis lucifugus* maternity colonies. This will provide opportunity to radio track adult females at the end of the summer to potentially locate hibernacula; this may facilitate an understanding of the male bias in the hibernacula and mist net captures during this study.

Exploration and late summer investigation of sinkholes known by local people, such as in the Lobstick Creek area.

COMMUNITY INVOLVEMENT:

Following the inventory work, I made a public presentation about bats including the findings from this survey at the Parks Canada office in Fort Smith, NWT.

Photo: C. Lausen

Little brown bat

Movement and Habitat Use by Adult Female Polar Bears

APRIL 18, 2011 TO JULY 1, 2011

MAIN INVESTIGATOR:

Andrew E. Derocher, Professor,
University of Alberta

WILDLIFE RESEARCH PERMIT NUMBER:

WL007425

LOCATION:

Southern Beaufort Sea, from Herschel Island to Baillie Islands, NWT.

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RATIONALE:

The study provides information on habitat use patterns, movement rates, identification of den sites, and population boundaries. The study aims to fill data needs for the analysis of oil-spill / polar bear models. Information from this study will also be used in environmental impact assessments and in reviewing oil-industry plans for exploration, development, and transportation in the Beaufort Sea.

OBJECTIVES:

- To deploy GPS satellite collars on adult female polar bears;
- To analyze population movements and responses to the changing sea ice;
- To determine habitat preferences and seasonal distribution;
- To test existing population boundaries with new movement data;
- To use the data to assess the use of the offshore oil and gas development areas by polar bears;
- To develop an oil spill-polar bear movement model to determine how many bears could be affected by oil spills of different size and duration; and
- To collect samples from seals killed by polar bears to monitor diet and polar bear hunting areas.

METHODS:

Capture will occur in the spring (April-May). As necessary, and within logistic and financial limitations, bears will be recaptured and re-instrumented to monitor individual bears over longer periods. The research area will be on the Canadian side of the Beaufort Sea between Herschel Island, YT, Tuktoyaktuk and Baillie Islands, NWT. Efforts will be made to search and capture bears on the north side of the shore lead away from hunters. All data will be shared with the Government of the Northwest Territories and all capture data will be stored with the Canadian Wildlife Service (CWS) and will be integrated into the National Polar Bear Database maintained in Edmonton by CWS.

RESULTS AND MAIN CONCLUSIONS:

No results and main conclusions submitted.

LONG-TERM PLANS AND RECOMMENDATIONS:

No long-term plans and recommendations submitted.

Taking measurements of a tranquilized polar bear cub.

Photo: A.E.Derocher

Photo: A.E.Derocher

Sea Ice near Tuktoyaktuk.

Black Bear Ecology in the North Slave Region

MAY 1, 2011 TO OCTOBER 30, 2011

MAIN INVESTIGATOR:

Dean Cluff, Regional Biologist,
Environment and Natural Resources,
GNWT, North Slave Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL006883

LOCATION:

The study area will be the North Slave Region, with focus on black bears in bear baiting station areas along Highway 3, south of Behchokǫ̀, NWT. If additional collars are available, bears around Yellowknife, NWT and the Ingraham Trail (Highway 4) will also be monitored.

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RATIONALE:

The North Slave Region (NSR) has used a considerable amount of staff and equipment resources over the past fifteen years responding to potential conflict situations between people and bears with little information gained. Also no studies of black bears (*Ursus americanus*) in the North Slave Region (NSR) have been done, therefore very little information is known about these bears in the northernmost part of their range. This lack of information was a limiting factor in assessing the impact of an outfitter's recent proposal to bait black bears. Concern has been expressed that baits will habituate these bears to people and create conflicts. Whether baiting bears creates additional conflict situations with people is unknown.

OBJECTIVES:

- To document the movements and range sizes of black bears in a sample of the northern boreal forest;
- To identify den site locations and their fidelity;
- To document movements and behaviour of black bears around highways and food attractants;
- To describe movement behaviour of bears that return after being relocated versus those that did not; and
- To provide management recommendations for re-locating bears in the NSR.

METHODS:

Black bears will be captured beginning in early May 2011 primarily along Highway 3, but near Yellowknife and Behchokǫ̀ as opportunities permit. Captures will be primarily by culvert traps or remote dart injection, but leg snares may also be used as the situation warrants. Both solitary bears and family groups will be targeted. Once chemically immobilized, all bears will be ear tagged and lip tattooed.

Adult bears captured will be collared with a GPS / Iridium radio collar to allow their movements to be tracked intensively (1 GPS location / 30 minutes) for two years. These duty cycles will allow the mapping of detailed movements for monitored bears.

Bears captured in response to managing conflict situations may also be collared and relocated. Relocation sites may be areas accessed by vehicle along Highway 3 and away from people, or more remote areas if a helicopter is available.

Tracking

GPS collars obtain locations with a resolution of about two to five meters. The GPS / Iridium collar will obtain a GPS location every 30 minutes. Location data will be transmitted daily to the Iridium satellite system after every 20 locations and emailed to the Project Leader.

Data Analysis

Black bear locations will be mapped with ArcGIS. Range use will be estimated with the fixed kernel method and other movement analysis methods. Analysis of movement patterns will include locations of all known bear baiting stations and other attractants. Individual based movement modeling will also be completed.

RESULTS AND MAIN CONCLUSION:

Three GPS collars were deployed on black bears in 2011 in collaboration with wildlife officers. Data collection is continuing.

LONG-TERM PLANS AND RECOMMENDATIONS:

Continue project in 2012.

COMMUNITY INVOLVEMENT:

Wildlife officers, Environment and Natural Resources and cabin owners along Highways 3 and 4.

Photo: M. Jackson

Black bear near Highway 4.

Population Management of Geese and Swans in the Inuvialuit Settlement Region Using Aerial Surveys and Banding Studies

SUMMER 2011

MAIN INVESTIGATOR:

Myra Robertson, Waterfowl Population Biologist for the Western Arctic,
Canadian Wildlife Service

WILDLIFE RESEARCH PERMIT NUMBER:

WL005405

LOCATION:

Since 1989, the Canadian Wildlife Service (CWS) has conducted aerial surveys and banded geese throughout the Inuvialuit Settlement Region (ISR) to monitor the abundance and productivity of geese and swans in the area. Goose banding operations took place at known moulting areas (where previous banding occurred) at the Mackenzie Delta, Tuktoyaktuk Peninsula and Anderson River on the mainland of the ISR.

PARTNERS:

- Wildlife Management Advisory Council (NWT)
- Polar Continental Shelf Project
- United States Fish and Wildlife Service
- Arctic Goose Joint Venture

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RATIONALE:

The ISR of the western Canadian Arctic is an important breeding and moulting area for greater white-fronted goose, Canada goose, lesser snow goose, brant, tundra swan, and several other species of waterfowl. Information on bird numbers, distribution, habitat requirements, survival, and productivity is needed to determine if current local and international harvest levels are sustainable and to ensure that populations are conserved for the long-term use by the Inuvialuit and others. This information is also timely for establishing baseline population information for areas of potential oil and gas development in the Mackenzie Delta.

OBJECTIVES:

- To monitor waterfowl populations in the ISR;
- To evaluate the effect of harvest and other stressors on western Arctic populations of waterfowl; and
- To monitor migration routes, harvest rates, and survival rates of the ISR mainland goose populations.

METHODS:

In July, flightless adult and young geese are captured using a helicopter to drive the geese into a netted enclosure, and banded with individually numbered metal leg bands. Information about banded birds submitted by hunters helps determine the migration routes, seasonal distributions, survival, and harvest rates for these birds.

RESULTS AND MAIN CONCLUSIONS:

Helicopter surveys at the Kendall Island and Anderson River snow goose colonies are conducted at three year intervals to determine the colony size at each location as long as the total number of adults remains above a set threshold. A decrease in the number of adults would warrant possible further management actions. Although the next set of surveys at both colonies is scheduled to be carried out in 2012, a survey was flown over Anderson

River colony this year because a helicopter and crew were already in the area banding geese. 2011 was relatively productive as many family groups of snow geese were seen, with a minimum estimate of 2,563 adults and 1,867 young counted in the area.

In July 2011, 1,343 white-fronted geese and one white-fronted / snow goose hybrid were banded at the Mackenzie Delta, Tuktoyaktuk Peninsula and Anderson River. In addition, we recaptured 35 white-fronted geese that were banded in previous years.

Band recoveries from our banding efforts show there has been an eastward shift in the winter distributions of white-fronted geese from the western Arctic compared to historical data. A higher proportion of geese were recovered in Louisiana and the Mississippi Alluvial Valley in Arkansas in recent years.

Annual summary reports are sent to regional contacts with our wildlife research permit applications.

LONG-TERM PLANS AND RECOMMENDATIONS:

The Canadian Wildlife Service (CWS) is currently undergoing a review of all bird monitoring programs in order to improve them. The results of the review will shape future monitoring activities for waterfowl populations in the western Arctic. Pending review results, future plans are to continue banding white-fronted geese and Canada / cackling geese on the ISR mainland in 2012. This data will improve our understanding of survival rates and movement of waterfowl from the ISR region to staging and wintering areas in the south. Our data has been, and continues to be an important reference as interest in developing natural resources in the Mackenzie Delta region grows.

COMMUNITY INVOLVEMENT:

CWS has reviewed all concerns and comments provided by the communities and discussed solutions directly with them. The main concern received by the communities was the opportunity for local hiring. The banding operations rely on transportation by helicopter and weight is restricted. This limits the number of passengers, banding gear and fuel that can be carried at one time as well as distance travelled before refueling. As such, opportunities for local participation are limited. In 2011, we were once again able to hire Kayla Nuyaviak, a local student from Tuktoyaktuk to help with banding.

Photo: Canadian Wildlife Service

Ducks soon to be banded

Arctic Shorebird Monitoring Program

JUNE 2011 TO JULY 2011

MAIN INVESTIGATOR:
Canadian Wildlife Service, Environment Canada

WILDLIFE RESEARCH PERMIT NUMBER:
WL005402

LOCATION:
Research was conducted in the Mackenzie Delta, Northwest Territories by a five person survey crew.

A temporary tent camp was stationed at Taglu Tower on Fish Island in the outer Mackenzie Delta from June 4, 2011 to July 12, 2011. This camp conducted shorebird monitoring inside the Kendall Island Bird Sanctuary (KIBS) and on Fish Island. Shorebird monitoring included but was not limited to intensive ground surveys, nest monitoring, banding shorebirds and collected genetic samples.

PARTNERS:

- Canadian Wildlife Service (CWS)
- Program for Regional and International Shorebird Monitoring (PRISM)
- Cumulative Impacts Monitoring Program, Indian and Northern Affairs Canada
- Manomet Centre for Conservation Science

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RATIONALE:

Arctic breeding shorebird populations continue to decline. Understanding shorebird dynamics (i.e. nest success, chick survival rates, adult survival, breeding site fidelity and population age structure) on the breeding sites and collection of genetic samples may help us determine why these declines are occurring.

This year was our second year working in cooperation with and instituting the protocols of the Arctic Shorebird Demographic Network (ASDN). ASDN is a North American working group that is working to determine what factors are limiting the populations of Arctic nesting shorebirds and contributing to declines in shorebird number.

OBJECTIVES:

- To collect demographic data on Arctic breeding shorebirds and document patterns of species presence and abundance;
- To gather genetic information on shorebirds that can be used to determine migration patterns; and
- To collect data on local weather and snow conditions, timing of insect emergence, and other variables that will help determine the impact of climate change on shorebird breeding ecology.

METHODS:

We intensively surveyed five plots in shorebird breeding habitat on Taglu, Fish and Niglintgak Islands for shorebird nests and described the nest habitat. Additional habitat was surveyed along the coastline of KIBS. Nests were monitored every five days until hatch to determine fate.

We banded adult and juvenile individuals of semipalmated sandpipers, pectoral sandpipers, stilt sandpipers, red-necked phalaropes, whimbrel, American golden-plovers and semipalmated plovers. Genetic samples (blood, feathers and fecal samples) were collected from semipalmated sandpipers, red-necked phalaropes and pectoral sandpipers. Blood and feather samples were also collected from Hudsonian godwits and whimbrel.

RESULTS AND MAIN CONCLUSIONS:

We found a total of 76 shorebird nests. We banded 54 adult shorebirds and 60 juveniles. Twenty-four of 35 nests on Taglu and Fish Islands hatched successfully. Nest success on Niglintgak Island was not determined as travel there was only possible once a week and sometimes the nests were gone by the time we arrived. Pectoral sandpipers, which were unusually absent from the site in 2010, had returned. We also found three cases of least sandpipers nesting in the wet sedge low centered polygon habitat on Fish Island. In previous years, we have only observed least sandpipers nesting in dry upland habitats.

LONG-TERM PLANS AND RECOMMENDATIONS:

The shorebird camp in the Mackenzie Delta is one of two Arctic Program for Regional and International Shorebird Monitoring (PRISM) Tier 2 (long term) shorebird monitoring sites in Canada. It is also part of the newly created ASDN which is drawing together arctic-breeding shorebird demographics from a variety of sites spread around the Arctic, using a standard set of protocols so the data can be part of a central database.

Additional studies in the area are dependent on the outcome of the Joint Review Panel's decision on the Mackenzie Gas Project (MGP). Should the MGP be approved, further studies will be necessary to monitor the impact of development on shorebirds breeding in the affected area.

COMMUNITY INVOLVEMENT:

Since 2005, CWS Shorebird Program has hired nine students from local communities including Fort McPherson, Yellowknife, Inuvik, and Tuktoyaktuk, to work as part of our field team (Candice Cockney, Kayla Hansen-Craik, Kayla Nuyaviak, Kim Jones, Margaret Noksana, Ryan Binder, Ryan Greig, Ryan Vittrekwa, and Shelby Skinner). Our research is supported by the Wildlife Management Advisory Council (NWT), the wildlife management board for the Inuvialuit Settlement Region. We regularly communicate with the Hunters and Trappers Committees in Inuvik and Tuktoyaktuk about our project and to obtain recommendations for research.

Photo: L. Pirie

Whimbrel chick

Long-Term Population Monitoring of Songbirds at Fort Liard, NWT

MAY 2011 TO SEPTEMBER 2011

MAIN INVESTIGATOR:

Craig Machtans, Forest Bird Biologist,
Canadian Wildlife Service

WILDLIFE RESEARCH PERMIT NUMBER:

WL005034

LOCATION:

Fort Liard, NWT.

PARTNERS:

Financial and logistical support was provided by:

- Canadian Wildlife Service, Environment Canada
- Aboriginal Affairs and Northern Development Canada (Fort Simpson office and Cumulative Impact Monitoring Program)
- Environment and Natural Resources (Fort Liard office).

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RATIONALE:

A crew from Canadian Wildlife Service (CWS) returned to Fort Liard, NWT in June 2011 to visit long-term sampling locations for counting songbirds. The work started in 1998 and is currently repeated once every three years (2014 is the next anticipated visit). The purpose of the current work is to document long term trends in songbird numbers in the region.

OBJECTIVES:

- The objective of this project is to count birds repeatedly over time to detect any long-term changes to their numbers in the Fort Liard area.

METHODS:

A total of 513 bird counts were conducted at 258 unique locations. Each location is usually visited twice during June. Bird counts are ten minutes long and conducted between sunrise and 9 a.m. Plots are permanently marked.

RESULTS AND MAIN CONCLUSIONS:

We counted 5,971 birds from 79 bird species. Our complete dataset now contains over 48,000 records from the area. One new species for the region was heard in early June, a blue jay. We have recorded 187 species since 1998 over the course of all work and including incidental observations.

A complex regression analysis that accounted for autocorrelation and observer effects was run on the data. Of 51 species analyzed, the summary is:

Nineteen species had significant trends. Twelve species were increasing. Of those 12, six had poor statistical power so the result is questionable in spite of statistically significant results. Seven species were decreasing. Of those seven, one had poor power and is questionable.

Thirty-two species did not show any statistical trend. Twelve species had good statistical power so it is highly likely the result is correct. Seven species had moderate statistical power, so the result is likely correct (no increase or decrease). Thirteen had poor statistical power, so it is unclear until more data are collected what the population trend of these species are. Results are presented graphically in a companion document.

The results are being integrated in a scientific paper to be submitted for peer-review and eventual publication in a scientific journal.

LONG-TERM PLANS AND RECOMMENDATIONS:

Results from this project are used by Environment Canada to understand bird population health in Canada. The long-term plan for the project is to continue to revisit the sites once every three years.

COMMUNITY INVOLVEMENT:

This year we did not hire any community help. The tragic loss of elder William Betthale when we were just starting our field program prevented our normal assistant (Gerry Betthale) from helping us.

Bay-breasted warbler.

Photo: C. Machtans

Photo: C. Machtans

Magnolia warbler.

Cooperative Waterfowl Population Surveys in the Northwest Territories

SPRING 2011

MAIN INVESTIGATOR:

James S. Wortham,
Chief of Waterfowl Populations Surveys,
United States Fish and Wildlife Service

WILDLIFE RESEARCH PERMIT NUMBER:

WL005762

LOCATION:

The surveys cover much of the Mackenzie Valley region, from the southern border of the NWT to the Mackenzie Delta region.

PARTNERS:

- United States Fish and Wildlife Service (USFWS)
- Canadian Wildlife Service (CWS)

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RATIONALE:

The Northwest Territories is one of the most important breeding and summering areas for ducks, geese, and swans in North America. Information on bird numbers, distribution, and population trends is needed to determine if current local and international harvest levels are sustainable, to ensure that populations are conserved for the long-term use, and to build appreciation by northern residents and all the other people residing within the migratory range of these species.

OBJECTIVES:

- To determine the size and species composition of the breeding populations of ducks and other waterfowl in the Mackenzie River drainage.

METHODS:

The survey procedure involves flying a single pass along straight transects in a single engine amphibious Cessna aircraft at a height of 46 m (150 feet). The procedures followed in conducting this survey are contained in the *Standard Operating Procedures for Aerial Waterfowl Breeding Ground Population and Habitat Surveys in North America, Section III, Revised 1987* document.

Two observers record all waterfowl species observed within 200 m (660 feet) on each side of the aircraft. All observations are geo-referenced and can later be summarized on transect, strata, provincial / territorial and continental levels.

RESULTS AND MAIN CONCLUSIONS:

The entire survey area experienced a late spring break-up; however, a period of warm, fair weather just prior to the survey greatly accelerated ice-out. Overall, breeding waterfowl habitat conditions in the Northwest Territories were rated as "good".

The 2011 total breeding duck estimate in central and northern Alberta, northeastern British Columbia, and the Northwest Territories was 19% lower than last year and similar to the long-term average (1955-2010).

Counts of mallards were 31% lower than 2010 and similar to the long-term average. The American widgeon estimate was similar to 2010 and 27% lower than the long-term average. Green-winged teal were similar to 2010 and 60% above the long-term average. Northern shovelers were 55% lower than the 2010 estimate and 40% below the long-term average. Northern pintails were 64% below 2010 and 67% below the long-term average. Canvasback estimates were similar to 2010 and 32% below the long-term average. The scaup estimate was similar to last year and the long-term average.

The 2011 Waterfowl Population Stratus report can be accessed online at: www.fws.gov/migratorybirds/NewReportsPublications/PopulationStatus/Waterfowl/2011WaterfowlStatusReport.pdf.

LONG-TERM PLANS AND RECOMMENDATIONS:

The waterfowl population survey program has evolved into the largest and most reliable wildlife survey effort in the world. For more than 50 years, cooperative waterfowl surveys have been performed by United States Fish and Wildlife Service (USFWS), Canadian Wildlife Service, state and provincial biologists and non-government partners. Survey results determine the status of North America's waterfowl populations, play an important role in setting annual waterfowl hunting regulations, and help guide the decisions of waterfowl managers throughout North America.

These surveys will continue until a more cost effective way is discovered to manage the North American waterfowl population.

COMMUNITY INVOLVEMENT:

Canadian Wildlife Service has reviewed all concerns and comments provided by communities and discussed solutions directly with them. The main concerns raised by the communities are opportunities for local hiring and disturbance to wildlife. The USFWS is unable to hire local help because of liability and legal issues as well as constraints in the U.S. civil service hiring regulations. Also, there are relatively few transects flown over a vast area once a year. It is expected that the surveys have a negligible effect on waterfowl and other wildlife.

Aerial Waterfowl Survey on Banks Island, Tuktoyaktuk Peninsula, and Western Victoria Island, 2011

JUNE 17, 2011 TO JUNE 30, 2011

MAIN INVESTIGATORS:

Deb Groves, Ed Mallek, Tim Moser –
United States Fish and Wildlife Service,
Migratory Bird Management

WILDLIFE RESEARCH PERMIT NUMBER:

WL005403

LOCATION:

Tuktoyaktuk Peninsula, the southern two-thirds of Banks Island, and western Victoria Island, NWT.

PARTNERS:

- Canadian Wildlife Service
- United States Fish and Wildlife Service
- Central Flyway Council
- Sea Duck Joint Venture
- Arctic Goose Joint Venture
- Mississippi Flyway Council

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RATIONALE:

The Canadian Arctic is an important breeding area for several species of waterfowl (e.g. Canada geese, greater white-fronted geese, king eiders, long-tailed ducks, and tundra swans). The population status and trends of waterfowl species have been monitored via programs established on wintering areas or at points along migration routes, with little or no information collected on their Arctic breeding grounds. For some species, e.g. king eiders and long-tailed ducks, existing quantitative data are extremely limited and apply only to broad-scale population levels. This lack of information hinders the ability of managers to understand the species' population dynamics and to identify causal factors associated with perceived changes in population sizes. Data on spatial distribution and abundance from breeding areas greatly complement information gathered elsewhere and allow for more effective monitoring and better-informed management decisions.

OBJECTIVES:

- To obtain population-size estimates and distribution information for waterfowl and other bird species within the study area; and
- To use the data collected to assist wildlife managers in efforts to design a long-term monitoring plan for birds in the Canadian Arctic.

METHODS:

Transects placed systematically at 20 km intervals across the survey areas were flown once with a Quest Kodiak airplane at 40 m altitude and 155 km/h. Two observers enumerated and recorded all birds (except shorebirds and small passerines) and large mammals observed within 200 m of the aircraft. We also recorded the locations of observations via a GPS unit interfaced with the data-collection program.

RESULTS AND MAIN CONCLUSIONS:

Data analysis is ongoing. A final summary report, including population estimates and distribution maps by species, will be produced in 2012 and will be distributed to interested parties. It will also be available at the United States Fish and Wildlife Service (USFWS) Alaska Region website: http://alaska.fws.gov/mbsp/mbm/waterfowl/reports.htm. The raw data (georeferenced bird and mammal observations) will be available to GNWT upon request.

LONG-TERM PLANS AND RECOMMENDATIONS:

The results from our 2011 survey, combined with data collected in other areas of the central Canadian Arctic in recent years, will be used to inform the design of a long-term monitoring survey of birds breeding in the Canadian Arctic.

COMMUNITY INVOLVEMENT:

The important waterfowl habitats included in this survey were previously delineated by CWS biologists, who worked with local community members to incorporate traditional knowledge of waterfowl distribution in the region.

Photo: D. Groves US Fish and Wildlife Service

Banks Island habitat.

Western Canada Cooperative Duck Banding Program at Willow Lake

AUGUST 2011

MAIN INVESTIGATOR:

Richard Popko, Wildlife Technician,
Environment and Natural Resources,
GNWT, Sahtu Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL005159

LOCATION:

Willow Lake, Tulita, NWT.

PARTNERS:

- Tulita Renewable Resources Council (TRRC)
- Environment and Natural Resources (ENR)
- United States Fish and Wildlife Service (USFWS)

CONTACT:

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RATIONALE:

Dabbling ducks are migratory waterfowl that are hunted throughout their range across North America. Banding large numbers of ducks across their summer range before the start of the hunting season and then documenting band returns from successful hunters allows us to plot the harvest distribution. The data are also useful in identifying migration and wintering grounds, which assists in efforts to protect habitats through joint ventures as part of the North American Waterfowl Management Plan.

OBJECTIVES:

- The United States and Canada Cooperative Banding Program sets annual banding objectives. Our objective is to band 2,000 mallards, 2,000 northern pintails, and all incidentally captured waterfowl (preferably 1,000 per species), prior to the opening day of duck hunting season (1 September).

METHODS:

Trap-sites have been selected in the Willow Lake area based upon the requirements of the traps, Traditional Environmental Knowledge and local knowledge of the area. Collapsible B-2 funnel traps are baited with germ-free cleaned barley. Approximately 2,250 kg (*ca.* 5,000 lbs.) will be used. The traps are checked at least once a day and all captured ducks are removed, banded, documented and released. Data entry of banding schedules is completed in Band Manager software and forwarded to the Canadian Wildlife Service in accordance with the conditions of the banding permit. An annual report will be presented to the Sahtu Renewable Resources Board, Tulita Renewable Resources Council, United States Fish and Wildlife Service, Canadian Wildlife Service Banding Office, and other interested groups. Band recovery data are also entered into the Sahtu GIS project.

RESULTS AND MAIN CONCLUSIONS:

This August marked the 16th year of duck banding at Willow Lake (between Norman Wells and Tulita). Standard leg bands were placed on 1,674 ducks: 718 mallards (43%), 466 northern pintails (28%), 300 American wigeon (18%), 184 American green-winged teal (11%), 4 blue-winged teal, 1 northern shoveler and 1 lesser scaup. This was above the 1995-2009 average of 1,338 ducks.

LONG-TERM PLANS AND RECOMMENDATIONS:

The banding station at Willow Lake is well established. Annual funding commitment from United States Fish and Wildlife Service is essential to operate the project. However the 2012 funding is not available so the project will be postponed with no firm commitment for future funding.

My recommendation is to continue annual pre-hunting season banding of dabbling ducks by this co-operative team. If funding issues continue, then the station equipment needs to be removed by aircraft and the cabins turned over to the Tulita District Land Corporation / Tulita Renewable Resources Council; or removed and the site reclaimed to its original condition.

COMMUNITY INVOLVEMENT:

All of the banding was done by Nathan Zimpfer (Wildlife Biologist USFWS), and assisted by Phillip Clemente (Banding Assistant, TRRC) and Blake Andrew (Banding Assistant, Sahtu Renewable Resources Board); Richard Popko (Wildlife Technician, ENR) provided logistical support.

Photo: US Fish and Wildlife Service

Ducks captured and awaiting banding

Western Canada Cooperative Banding Program

AUGUST2011 TO SEPTEMBER 2011

MAIN INVESTIGATOR:

Jon Klimstra, Wildlife Biologist,
United States Fish and Wildlife Service

WILDLIFE RESEARCH PERMIT NUMBER:

WL006884

LOCATION:

Stagg River delta, approximately 13 miles southeast of Behchokǫ̀, NWT.

PARTNERS:

Canadian Wildlife Service

CONTACT:

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RATIONALE:

This station is one of approximately 20 banding stations in western Canada that band pre-season waterfowl in the support of waterfowl management in North America.

OBJECTIVES:

- Pre-season banding of 2,000 mallards, 1,500 northern pintails and 1,000 of all other waterfowl species at each of the approximately 20 banding stations in western Canada. In 2011, the Stagg River station banded 290 ducks including: 181 mallards, 31 American green-winged teal, 3 American wigeon, and 75 northern pintail.

METHODS:

Swim-in bait traps will be used. Traps: 8'x8'x4' - 1"x2" mesh welded wire with loafing platforms.
Bait: approximately 4,000 lbs of "cleaned" Canadian barley will be used.

RESULTS AND MAIN CONCLUSIONS:

A total of 290 birds were banded over the course of trapping. The majority of birds banded across all species were made up of hatch year birds, which potentially indicates production was good for this year.

LONG-TERM PLANS AND RECOMMENDATIONS:

This station will continue to be operated and band pre-season waterfowl.

COMMUNITY INVOLVEMENT:

Since the inception of this station we have utilized local business for lodging, fuel, groceries, and supplies.

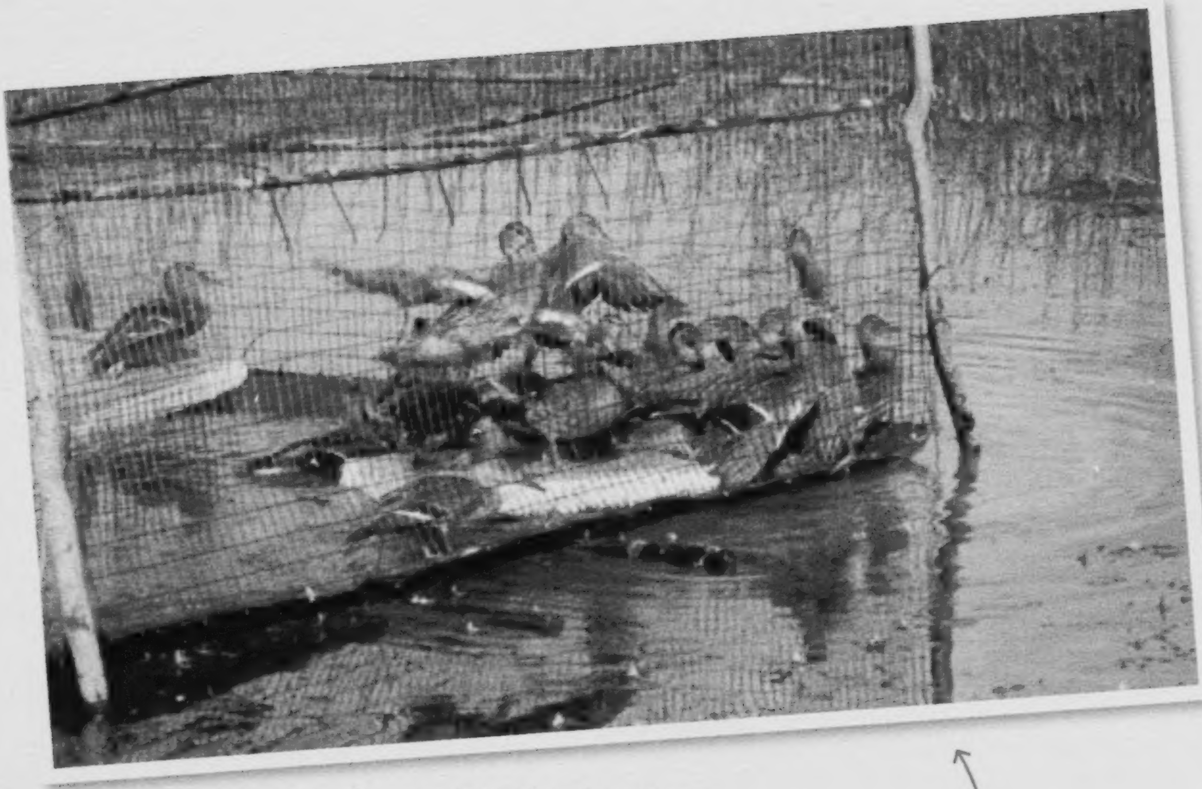

Photo: US Fish and Wildlife Service

A collection of mallards inside a bait trap.

Western Canada Cooperative Pre-season Waterfowl Banding Program Mills Lake Station, NWT

AUGUST 8 TO 26, 2011

MAIN INVESTIGATOR:

David Fronczak, Wildlife Biologist,
United States Fish and Wildlife Service

Wildlife Research Permit Number:

WL004824

LOCATION:

Mills Lake, 21 miles WNW of Fort Providence, NWT. Banding was conducted within the marsh on the east end of the lake.

PARTNERS:

- South Slave Region, Environment and Natural Resources, GNWT (permits)
- Fort Providence community (supplies, gas, and logistical assistance)
- Canadian Wildlife Service (banding permit)
- United States Geological Survey, Bird Banding Laboratory (bands)

CONTACT:

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RATIONALE:

Pre-season waterfowl banding at Mills Lake, NWT has been an ongoing event since 1964. Within the 40 years of operations, over 88,000 waterfowl have been banded. Band recovery information is used to help determine migration routes, assess harvest pressure, measure vulnerability to harvest pressure, estimate waterfowl production rates, and estimate survival rates of a breeding population. Mills Lake has proven to be an important area towards the overall waterfowl population monitoring program by providing a cost effective way to sample a segment of the boreal breeding population.

OBJECTIVES:

- To pre-season band 1,000 mallards (of each cohort) for the combined banding effort within the Northwest Territories.

METHODS:

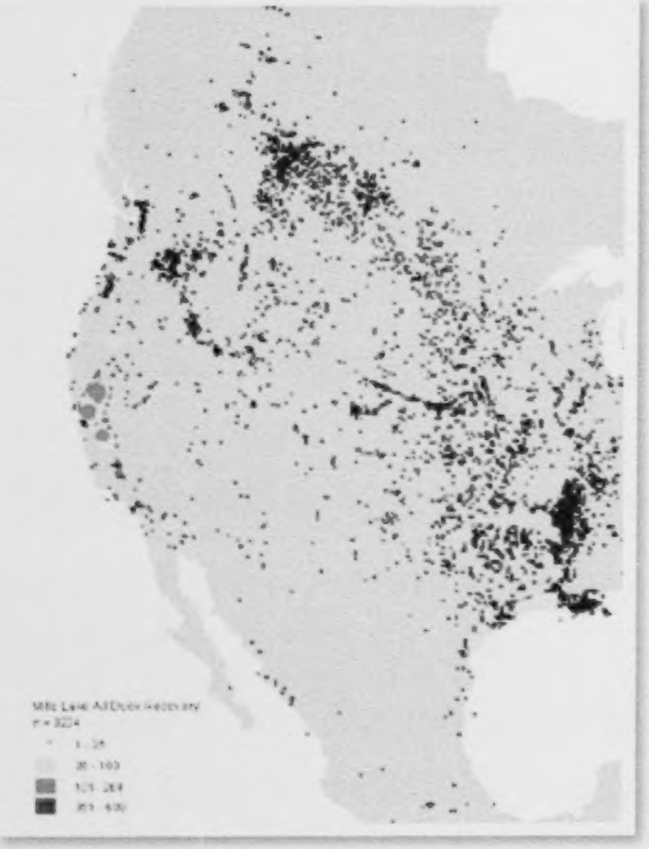
Waterfowl were trapped within baited wire funnel traps. Traps were placed in strategic areas within the marsh and checked daily after baiting has been initiated. Caught birds are herded into a catch box for processing. Biological information such as species, age, sex, date and location are then recorded for each bird. A federal aluminum band is placed on the bird's leg and the bird is released. Each band has a unique number which links the collected biological information to that bird. Persons that encounter banded birds are highly encouraged to report the band number to a wildlife agency, Government of the Northwest Territories (GNWT) or to the Canadian Wildlife Service's Banding Office, 1-800-327-band or at www.reportband.gov.

RESULTS AND MAIN CONCLUSIONS:

A total of 2,028 ducks were banded (1,351 mallards, 609 northern pintails, 63 American green-winged teal, 3 American wigeon, and 2 blue-winged teal) over a 13 day period (August 14 - 26). For mallard and northern pintail, the percentage of young totaled 39%, and 89% respectively. Thirteen previously banded ducks were captured, consisting of seven mallard and six northern pintail. Detailed information can be obtained from the *Mills Lake 2011 Preseason Banding Report* from the South Slave Environment and Natural Resources GNWT office.

LONG-TERM PLANS AND RECOMMENDATIONS:

Long-term plans include the continuation of annual pre-season banding at Mills Lake, NWT. Mills Lake is a unique staging area for waterfowl and logistically feasible for gathering pertinent information on waterfowl for population monitoring and management that pertains specifically to the Mackenzie River's boreal forest region. Recommendation is for the regional communities and the resource management agency's continued support for pre-season banding within Mills Lake.



Recovery locations of ducks banded at Mills Lake.

Photo: US Fish and Wildlife Service

Mesh trap and bait station.

Whooping Crane Ecology and Rehabilitation

MAY 1, 2011 TO OCTOBER 31, 2011

MAIN INVESTIGATOR:

Mark Bidwell,
Canadian Wildlife Service

WILDLIFE RESEARCH PERMIT NUMBER:

WL004807

LOCATION:

The project took place within a 200 km radius circle centered at 60° 10" north, 113° 20" west.

Most whooping cranes breed within Wood Buffalo National Park (WBNP), however, there are several nests north of the Nyarling River outside the northern park boundary. Also there are two nests in Lobstick marsh which is just east of the Little Buffalo River, east of the park boundary.

PARTNERS:

- Crane Trust
- Platte River Recovery Implementation Program
- International Crane Foundation
- Parks Canada
- United States Fish and Wildlife Service
- United States Geological Survey

CONTACT:

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RATIONALE:

Whooping cranes are listed as an endangered species under the *Species At Risk Act* (SARA). Since 1966, the Canadian Wildlife Service (CWS) and United States Fish and Wildlife Service (USFWS) have increased management efforts for whooping cranes resulting in a population increase from a low of 21 birds in 1941, to the current population of about 280 in the wild in Canada (2010). In addition, surplus eggs were collected in WBNP to establish a captive population which now numbers 151, and additional wild populations have been established from both captive and wild produced eggs that number an additional 119 birds. Additional management activities are expected to further increase the wild population.

OBJECTIVES:

There were three key objectives to this project:

- Breeding pair surveys: To provide an accurate count of breeding pairs in the population which can be used to gauge the health and well-being of this flock.
- Capture and banding of pre-fledged chicks: To answer questions regarding whooping crane migratory ecology and behaviour during migration using GPS. Specifically : a) stopover areas, habitat use patterns, and factors influencing habitat use at different spatial and temporal scales, b) how the current migratory route compares to previous route models and to determine environmental and anthropogenic factors that may influence migratory behaviour, and c) to identify causes, locations, and conditions of actual or potential mortality.
- Fledging success surveys: To determine the mortality between hatch and fledging, and the number of family groups expected on the migration route and arriving in Aransas National Wildlife Refuge complex in Texas.

METHODS:

Aerial surveys over the whooping crane summer range in and around Wood Buffalo National Park (WBNP), NWT. Breeding pair surveys between May 1-30; pre-fledge chick capture and chick survival surveys August 1-10.

Breeding pair counts by fixed-wing aircraft and / or helicopter between May 1-30 of each year:

- plot locations on aerial photographs
- record GPS coordinates for nests
- record band colours
- determination egg laying dates and clutch size

Rotary wing aircraft surveys in August were used to capture and band pre-fledge chicks. We will trap hatch-year birds before fledgling age with the use of a helicopter. From 1977-1988, CWS banded 134 juveniles in WBNP, and we will capture birds using the same techniques. The capture crew will consist of three personnel; a veterinarian, handler, and bander. The crane will be cornered and either hand-grabbed or a long-handled net will be placed over the bird to subdue it. The handler will control the crane while the veterinarian and bander collect samples, take measurements, and attach leg bands. We will attach GPS Platform Transmitter Terminals (PTTs), a federal leg band, and a unique combination of coloured leg bands.

Surveys were conducted slightly differently this season. A Bell 206 Jet Ranger helicopter was used for the majority of the nest searching to increase safety and visibility.

Helicopter surveys were conducted May 14-17 for a total of 17.7 hours. An additional 7.2 hours of fixed wing flying in a Cessna 210 was done May 18 and 19. The fixed wing flying searched whooping crane territories where no pairs were yet seen and answered questions about pair identities. Breeding pair surveys were conducted by Mark Bidwell (CWS) and Kathy St. Laurent (CWS).

On August 2, Mark Bidwell and Felipe Chavez-Ramirez (Gulf Coast Bird Observatory) flew for 4.8 hours in the Bell 206 to locate family groups suitable for capture. It was decided that families with twins were not eligible for capture because it would be too great a disturbance to the family group splitting up both young and parents. Fifteen attempts were needed to capture twelve chicks on August 3 and 4. The ground capture crew consisted of Mark Bidwell, Felipe Chavez-Ramirez, Dave Brandt (USGS), and Barry Hartup (DVM with the International Crane Foundation) with Rhona Kindopp (Parks Canada) guiding activities from the helicopter. Jim Dewitte from Wood Buffalo Helicopters was our pilot. A total of 10.4 hours were spent in the helicopter.

Once families were located, the helicopter circled and found a suitable landing spot where the ground crew was dropped off (typically 200-300 meters from the family group). The helicopter then hovered and positioned itself between the family and ground crew, giving the crew an aerial target to walk towards in the dense, high vegetation. Radio contact between the helicopter and ground crew allowed for better coordination and took advantage of the aerial view of the chicks' movements and location. Families did not appear stressed from the presence of the helicopter and walked slowly away from it, stopping to preen or feed. Once the ground crew was visible to the adults they typically flew away. Chicks appeared to have one of two responses to the ground disturbance; they made their way to cover or they fled and were impossible to round up and capture. It became obvious how the chick was going to respond within the first few moments of the adults flying away leaving the chick.

Blood, feather and cloacal swab samples were taken from all chicks but no feces were collected as the birds did not defecate. It was felt that all chicks were in optimal condition based on the veterinarian's health inspection. Chicks were estimated to be one to two weeks from flying based on primary growth. Measurements taken were weight and tarsus to reduce handling time.

RESULTS AND MAIN CONCLUSIONS:

Since 1965 the population has grown from 44 individuals to about 280. During surveys, 75 whooping crane nests were discovered. This is the highest number of nests on record and similar to 2010, likely attributable to a pulse of new birds hatched three to five years ago entering the breeding population.

A total of seven nests were outside the park; two in Lobstick Creek to the east and five to the north of the Nyarling river. Six nests were in new territories, of which five were within the park and one was outside the park approximately 10 km further north of north Nyarling established territories. An additional 11 territorial pairs, without nests, were found in the breeding marshes indicating a healthy breeding population and a significant potential expansion in coming years.

LONG-TERM PLANS AND RECOMMENDATIONS:

It is very rare in wildlife ecology to be able to monitor an entire population and track individuals for extended periods of time. Due to the small size of the Wood Buffalo-Aransas whooping crane population, the birds' size and colour, and their high degree of territoriality, it has been possible to monitor the population in great detail. This long-term data has provided incredible insight to the populations' growth, obstacles and path to recovery.

Despite a healthy average annual growth rate of 4%, reaching the recovery goal of 1,000 birds in the wild is many years away. The long-term plans for this project are to continue monitoring breeding effort and chick production. We would like to relate these variables to habitat conditions and quality to better forecast future expansion of the breeding grounds, and forecast future impacts from global warming and changes in water quality and quantity.

Photo: R. Kindopp

Whooping crane chick wearing leg bands.

COMMUNITY INVOLVEMENT:

We received only one comment directly related to our whooping crane work from a First Nation community. The Deninu K'ue First Nation indicated they were pleased with how we worked with communities and honored our research permit.

Photo: R. Kindopp

Much cooperation is needed to successfully band a whooping crane chick.

Latitudinal Variation in Life History Traits and Carry-Over Effects of Yellow Warblers

MAY 15, 2011 TO JULY 20, 2011

MAIN INVESTIGATOR:

Dr. David Green,
Simon Fraser University

WILDLIFE RESEARCH PERMIT NUMBER:

WL005401

LOCATION:

Inuvik, NWT.

PARTNERS:

- Canadian Wildlife Service (CWS)
- Aurora Research Institute (logistical support)

CONTACTS:

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Michaela Martin, MSc. Candidate
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RATIONALE:

Latitudinal variation in life history traits is common for many species; however, the underlying factors influencing this variation are not well understood. Species with wide breeding distributions, such as yellow warblers, provide an excellent opportunity to study potential trade-offs among breeding parameters and vital rates at different latitudes. In addition, recent migratory songbird studies have shown that events on wintering grounds can carry-over into the breeding season and influence individual reproductive success and dynamics of populations on the breeding grounds. This is important given long-term declines in many songbird species. By using direct monitoring of breeding pairs and by testing the stable isotope composition of their feathers, we plan to link reproductive success to locations and habitats these birds occupy in the winter. We will evaluate latitudinal differences in breeding activities for evidence of life history trade-off. Additionally, we will look at how variation in climatic conditions and winter habitat use influence the arrival times, condition and the number of offspring had by these birds.

Photo: M. Martin

Female yellow warbler on her nest.

OBJECTIVES:

- To evaluate the latitudinal variation in life history traits of yellow warblers;
- To test the generality of winter habitat impacts on breeding success ("carry-over" effects) in neotropical songbirds by studying a species on the western flyway; and
- To determine whether there is a latitudinal impact on carry-over effects. It is expected that carry-over effects will be more pronounced for birds breeding in more northerly locations.

METHODS:

Breeding activities were monitored and feathers sampled at two locations in Canada: Revelstoke, BC and Inuvik, NWT. Data from Revelstoke was collected by team research technicians under the supervision of Dr. David Green. Breeding activities (date of first egg, clutch size, development periods, and number fledged) were monitored throughout the season at each site. The majority of all breeding adults were captured using mist nets. Each bird had standard body metrics taken, six feathers sampled-three greater covert (moulted on wintering grounds), two primary coverts and a single retrice (moulted on breeding grounds), and was colour-banded for identification purposes. Nestlings were banded at seven days of age.

RESULTS AND MAIN CONCLUSIONS:

The first male yellow warbler arrived on our study site on 22 May. Males arrived over a 20 day period, with the majority arriving near the end of May. Females followed shortly thereafter. A total of 114 adults were caught throughout the season and were sexed, aged, measured and feather sampled. Of these, 90 adults were new captures and were newly banded. The earliest nest was initiated on May 26 and the last nest was predicted to fledge on July 28. Over the course of the breeding season we monitored 49 breeding pairs and located a total of 77 nests, 61 of which turned active with eggs. Average clutch size across all breeding attempts was 4.2 eggs, incubation periods spanned 11 days, and young usually left nests after 9 days. Approximately 70% of all breeding pairs successfully fledged young. Relative to the Revelstoke population, males arrived later, nests were initiated over a shorter time period and later in the season, clutch sizes were larger, development periods were similar and overall pair survival was higher in Inuvik. Yellow warblers breeding at high latitudes appear to have shifted some but not all life history traits towards a "fast" life history. Stable isotope data from 2011 feather samples are currently being analyzed.

LONG-TERM PLANS AND RECOMMENDATIONS:

This was the final year of a three year study of breeding ecology of yellow warblers in Inuvik, NWT (2009-2011). We plan to return during the 2012 season to resight banded individuals from previous breeding seasons. Band returns will allow for a better estimate of population survivorship. The Inuvik study sites appear to be important breeding sites for yellow warblers as they are high density, productive breeding grounds.

COMMUNITY INVOLVEMENT:

On 7 June 2011, we presented our research to students enrolled in the Environment and Natural Resources Technology Program at Aurora College, and invited students to participate in our research. On 14 July 2011, we provided a public presentation of our research proposal, methods and preliminary findings at the Aurora Research Institute. Throughout the season, we stayed in contact with the Gwich'in Renewable Resources Council and offered to take on students to provide experience with bird i.d., nest monitoring and bird banding.

Late Winter Recruitment of the Tuktoyaktuk Peninsula, Cape Bathurst, and Bluenose-West Barren-ground Caribou Herds

APRIL 2010 TO MARCH 2011

MAIN INVESTIGATOR:

Tracy Davison, Regional Biologist, Environment and Natural Resources, GNWT, Inuvik Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL007410

LOCATION:

Range of the Tuktoyaktuk Peninsula and Cape Bathurst barren-ground caribou herds in the Inuvialuit Settlement Region (ISR).

PARTNERS:

This study was jointly funded by Inuvialuit Wildlife Studies Funds, and Environment and Natural Resources.

CONTACT:

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RATIONALE:

Late winter (March-April) recruitment surveys provide estimates of the number of calf caribou that will enter the adult (1-year and older) population each year. Recruitment estimates are one of the key means for determining future growth potential of a caribou population.

OBJECTIVES:

- To obtain a current estimate of late winter recruitment for the Tuktoyaktuk Peninsula (TP), Cape Bathurst (CB), and Bluenose-West (BNW) barren-ground caribou herds.

METHODS:

All groups of caribou seen were classified. Classification was done from the air by flying a single pass over the caribou. Each caribou was classified as a cow, calf, or bull (young or mature). Classification was based on size, presence/absence and size/configuration of antlers, and sex-organs (presence/absence of vulva patch, and penis sheath).

RESULTS AND MAIN CONCLUSIONS:

As there were not any collared caribou in the ISR during the time period of this survey, the Bluenose-West herd was not included in this survey.

The number of calves per 100 cows was 47.4 ± 2.8 (SE) for the CB herd, and 52.4 ± 4.6 for the TP herd. These recruitment rates were not significantly different from 2010 for the CB herd (48.2± 3.0 in 2010). However, the TP herd had a slightly higher rate than 2010 (TP 46.6 ± 2.3 in 2010).

LONG-TERM PLANS AND RECOMMENDATIONS:

Our observations in 2008 to 2011 suggest consecutive years of good recruitment into these herds following relatively poor recruitment in 2007. Current recruitment rates are closer to ratios observed during the 1980s when the population was increasing.

COMMUNITY INVOLVEMENT:

A local observer was hired to help with the survey.

Photo: A. Gunn

Barren-ground caribou

Population Monitoring of the South Nahanni and Coal River Caribou Herds

OCTOBER 2011

MAIN INVESTIGATOR:

Troy Hegel, Ungulate Biologist,
Environment Yukon

WILDLIFE RESEARCH PERMIT NUMBER:

WL005765

LOCATION:

From October 2-7, 2011, the South Nahanni and Coal River northern mountain caribou herds were surveyed during fall composition counts. The South Nahanni survey took place in the South Nahanni river watershed, in the trans-boundary area north of the Cantung mine and in and adjacent to Nahanni National Park Reserve, east of the Flat River. The Coal River survey took place in an area west of the Flat River to the Hyland River (YT).

PARTNERS:

- Environment Yukon
- Parks Canada (Nahanni National Park Reserve and Park Establishment Branch)

CONTACTS:

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RATIONALE:

The South Nahanni and Coal River mountain caribou herds are both readily accessible, with all-season roads located within their ranges. Previous surveys and counts of the South Nahanni herd suggest that the herd may be heavily harvested, based on lower bull:cow sex ratios. The harvest rate in 2001 was estimated to be between 4-5%, substantially higher than the 2-3% recommended by the Yukon Woodland Caribou Management Guidelines. This potentially high harvest level is coupled with recruitment rates that have been lower than average for other mountain caribou herds throughout the Yukon Territory. Given the concern over the population dynamics of the herd, additional yearly monitoring of population parameters is warranted to gain a more complete assessment of the herd's health, compared to what can be inferred from a single year's estimate.

Furthermore, information on the space use of the South Nahanni herd is relatively sparse. The South Nahanni herd is bordered by three other herds: Coal River (south), Finlayson (west), and Redstone (north). Obtaining a better understanding of how the South Nahanni herd uses the landscape will aid management as more detailed seasonal range delineation will reduce the likelihood that animals from other herds are included in monitoring and/or population estimation activities. Additionally, given the high amount of industrial activity occurring along the YT-NWT border, a more comprehensive understanding of landscape use by this herd may provide information to better mitigate impacts of development. The Coal River herd has been surveyed four times before (1997, 2008, 2009 and 2010) and given the accessibility of this herd to hunters, obtaining more information on its demographic health is also warranted.

OBJECTIVES:

- To estimate the composition of the South Nahanni and Coal River mountain caribou herds, specifically recruitment (calf:cow) and sex (bull:cow) ratios; and
- To collect spatial information on seasonal distribution patterns of the South Nahanni caribou herd.

METHODS:

For both the South Nahanni and Coal River herds a helicopter was used to fly at or above treeline, focussing on high plateaus, which are areas known to be used by mountain caribou during the rut. Routes were flown and areas chosen so as to avoid double-counting of animals. When a group was observed, its composition was assessed and animals were classified into one of five categories: calves, adult female, immature male, mature male, or unclassified. All attempts were made to classify each animal in a group. The locations (latitude /longitude) of groups were recorded using GPS.

Spatial location data from the South Nahanni herd is obtained from satellite collared adult females. Thirty females were collared in 2008 and will be monitored through 2012.

RESULTS AND MAIN CONCLUSIONS:

In the South Nahanni survey (~ 14 hours of flying), 484 animals were classified resulting in a calf:cow ratio of 24.7 calves:100 cows, and a sex ratio of 43.9 bulls:100 cows. In the Coal River survey (~ 12 hours of flying), 271 animals were classified resulting in a calf:cow ratio of 35.2 calves:100 cows, and a sex ratio of 32.1 bulls:100 cows. Calf recruitment in both herds was similar to those in 2010 and higher than in previous years (2008, 2009). This may be due to more favorable weather conditions at calving during the 2010 and 2011 springs. This level of recruitment generally follows a pattern observed in other mountain caribou herds across the Yukon this year.

LONG-TERM PLANS AND RECOMMENDATIONS:

Remaining satellite collars will be monitored during the next year to provide more precise estimates of seasonal distribution and movement patterns. This was the final year of planned monitoring for these herds in this four-year project. During 2012/2013, a detailed report synthesizing all information including composition surveys, population estimates, and satellite collar information will be prepared.

COMMUNITY INVOLVEMENT:

Copies of this and all other reports are provided to communities and Boards. Throughout this long-term project efforts have been made to have community members on survey flights when possible and to date we have had observers from Tulita and Watson Lake participate on the surveys. Observers for the 2011 survey were Troy Hegel, Matt Clarke, and Ryan Drummond, all with Environment Yukon.

Photo: T. Hegel

Coal River mountain caribou herd

Population Parameters, Movements, Distribution, and Habitat Use of the Beverly and Ahiak Barren-ground Caribou

FEBRUARY 2011 TO FEBRUARY 2012

MAIN INVESTIGATOR:

Allicia Kelly, Regional Biologist,
Environment and Natural Resources,
GNWT, South Slave Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL005757

LOCATION:

Beverly/Ahiak barren-ground caribou range (includes communities of Lutsel K'e, Fort Resolution and Fort Smith in the NWT). The closest NWT community is Lutsel K'e.

PARTNERS:

- Deninu K'ue First Nation
- Environment and Natural Resources
- Lutsel K'e First Nation
- Salt River First Nation
- Smith Landing First Nation
- NWT Métis Nation

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RATIONALE:

The range of the Beverly/Ahiak barren-ground caribou herds is one of the largest in North America. These caribou range from northern Saskatchewan to the Queen Maud Gulf and Northeast Mainland of Nunavut. Mineral exploration is occurring on spring and fall migration corridors, calving, post-calving, fall rutting and wintering areas in the NWT and Nunavut. There are also mines and winter roads on their southern winter range in northern Saskatchewan. This range is remote and little observational information on these herds' distribution is obtained each year and only where caribou range near communities. Collar technology is an invaluable tool to collect information on seasonal movements and range use patterns and to aid in surveying population parameters. Monitoring collar locations provides the most cost effective and least intrusive method for obtaining information needs on caribou movements and distribution to assess the cumulative impacts of human activity and natural disturbances. Collars also aid in designing surveys to monitor population parameters and population estimates.

Collar information indicates that at least a portion of the Beverly herd has shifted northwards, from calving on the traditional Beverly calving ground near Pelly Lake, to calving in the Queen Maud Gulf (Ahiak) area in the late 2000s. Continuing to monitor Beverly/Ahiak caribou is important to determine the status of these caribou and to understand factors driving changes in herd status and range use.

The Government of Nunavut is conducting a population survey of these caribou in June 2011. Government of the Northwest Territories (GNWT) collars and survey data will contribute to designing and conducting the survey. Sex ratios from survey data will help refine estimates of total herd size.

OBJECTIVES:

- To continue to monitor the distribution and movements of collared Beverly/Ahiak cows, to:
    - get information on seasonal use patterns, movement rates and migration routes;
    - evaluate the movements of cows in relation to human and natural disturbances; and
    - aid in surveying population parameters;
- To measure sex ratio and over-summer calf survival (fall survey);
- To measure 10-month calf survival (late winter survey); and
- To opportunistically collect and analyze biological specimens.

METHODS:

Continue to acquire location data from the satellite collars currently deployed on Beverly/Ahiak caribou. Locations are mapped weekly.

For fall sex ratio and 10 month-calf survival surveys: (survey methods are similar). A fixed wing reconnaissance survey may be required for allocation of effort in relation to the distribution and density of caribou observed as well as the location of collared cows. A helicopter crew consisting of a spotter, recorder and pilot will fly over groups of caribou and classify as calves, cows, yearlings and bulls. Cochran's (1977) Jackknife technique will be used to calculate age and sex ratios and their associated variances on a daily basis to ensure that the required level of precision is achieved.

Further aerial surveys (helicopter or fixed wing) will only be conducted if unexpected events make it necessary to investigate caribou distribution and habitat conditions over the Beverly/Ahiak range.

Biological specimens (examples: skin samples for DNA testing and to check for effects of collars, fecals for parasite work) will be collected where necessary and/or opportunistically.

RESULTS AND MAIN CONCLUSIONS:

Collared caribou were monitored throughout the year. Collared cow locations were mapped weekly and movements were used in survey planning and analyses.

In March 2011 there were 15 active collars on Beverly/Ahiak cows. These collars were deployed in 2006 (1), 2007 (3), 2008 (9) and 2009 (2). Between March 2011 and February 2012 there were eight mortalities; two in each of April, July, and August; one each in December and February; and one collar dropped off as scheduled.

Caribou necropsies were completed on 16 caribou (8 males, 8 females) harvested during Aurora College's Environment and Natural Resources Program (ENRTP) winter camp from March 1-4, 2011. This provides a learning opportunity for students as well as valuable biological data. The camp location was north of Orpheus Lake, NWT (61.11° N 106.46° W). This location is in a wintering area that has been used in recent years by both Beverly and Qamanirjuaq caribou. Nunavut and GNWT collar location data from 2011 indicated that Qamanirjuaq caribou were most likely sampled during this winter camp.

A spring composition survey was conducted April 5-9, 2011. Prior to the composition survey a reconnaissance survey was flown (April 1-5, 2011). During the composition survey 7,304 caribou were classified. The calf:cow ratio was 57 calves:100 cows.

A fall composition survey was conducted from October 25-29, 2011. Prior to the composition survey a reconnaissance survey was flown (October 22-28, 2011). Overall 12,421 caribou were classified. The overall sex ratio was 69 bulls:100 cows.

Updates on this monitoring program were shared at the May 2011 and November 2011 meetings of the Beverly and Qamanirjuaq Caribou Management Board (BQCMB) and at the November 2011 South Slave Regional Wildlife Workshop. Data was shared with the Nunavut Government to assist with the 2011 calving ground based population survey.

LONG-TERM PLANS AND RECOMMENDATIONS:

Monitoring of barren-ground caribou on this range will continue in 2012/13. By January 2013 there will be no active collars remaining from the 2006 to 2009 deployments. We recommend that a minimum of 20 GPS collars be deployed across this range in March 2012. ENR staff will assist the Government of Nunavut with a calving ground population survey in June 2012.

COMMUNITY INVOLVEMENT:

Community members assisted as observers on aerial reconnaissance surveys. Sample collections are done in cooperation with Aurora College's Environment and Natural Resources Technology Program.

Community representatives on the Beverly and Qamanirjuaq Caribou Management Board (BQCMB) support the continued monitoring of these caribou and the collection of biological data that will help assess the state of these caribou.

Photo: A. Kelly

Barren-ground caribou bulls fighting.

Photo: A. Kelly

Migrating barren-ground caribou.

Aerial and Ground-based Caribou Surveys of the Winter Road

MARCH 8, 2011 TO APRIL 15, 2011

MAIN INVESTIGATOR:

Erik Madsen, Director Winter Road Operations, Tibbitt to Contwoyto Joint Venture Management Committee

WILDLIFE RESEARCH PERMIT NUMBER:

WL005699

LOCATION:

The wildlife monitoring program was conducted along the southern part of the winter road, from Tibbitt to Lockhart Lakes, NWT.

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RATIONALE:

To monitor wildlife within the vicinity of the road.

OBJECTIVES:

- To document the general distribution and number of caribou in relation to the winter road.

METHODS:

The object is to collect appropriate information that will assist the operators of the winter road in verifying the numbers and general distribution of barren-ground caribou in relation to the road using aerial surveys and GPS locations, and ground-based road observations.

RESULTS AND MAIN CONCLUSIONS:

Two aerial surveys were conducted during winter road operations and resulted in a total of four observations and 26 caribou seen. There were also three wolves and one wolverine spotted during these surveys. Numerous occurrences of caribou sign, such as tracks (119) and bedding areas (28) were observed during each survey. All these observations were close to the Lockhart Lake camp, near Brown Lake. Additionally, one moose and ten sets of moose tracks were observed along the route.

In addition to the aerial surveys, the Winter Road Communities Environment Committee travelled the road to observe any wildlife and monitor environmental performance along the road. No caribou were seen during the Committee's travels in 2011.

LONG-TERM PLANS AND RECOMMENDATIONS:

The Tibbitt to Contwoyto Winter Road Joint Venture views the Winter Road Communities Environment Committee as a valuable resource to monitor the road and assist with inspections and wildlife observations. The Joint Venture plans to continue working with this Committee to carry out inspections along the road. There have been many issues raised recently by communities in relation to the impacts of aerial surveys on caribou. In response to these concerns, the Joint Venture is not planning to conduct further aerial surveys during the 2012 winter road season.

COMMUNITY INVOLVEMENT:

Northern residents will continue to be an integral part of the wildlife monitoring programs for the winter road by providing assistance, local knowledge, and a northern perspective.

During 2011, the Winter Road Communities Environment Committee travelled the road.

Numerous community members are hired to assist with the construction and operation of the road. These and other employees working on the road record incidental wildlife observations that may occur at any time, either at the road camps or on the road itself.

Community members also participate in annual spring surveys of the road, as well as archaeological surveys along the road, in order to ensure that local participation and knowledge from different communities is incorporated into the various monitoring programs. This also allows for community members to work on the land and gain a better understanding of mining developments and the infrastructure required to support such operations in remote areas.

Photo: A. Gunn

Male and female barren-ground caribou

Bathurst Caribou Health, Condition and Contaminant Monitoring

JANUARY 2011 TO DECEMBER 2011

MAIN INVESTIGATOR:

Bruno Croft, Manager Research and Monitoring,
Environment and Natural Resources,
GNWT, North Slave Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL006878

LOCATION:

The Bathurst caribou collection was conducted by Yellowknife Dene First Nation (YKDFN) hunters on January 25th, February 5th and March 27th 2011 on Lockhart, Drybones and Mackay Lake, NWT.

PARTNERS:

- Tłıchǫ Government
- Community of Wekweètì (spring hunt)
- Yellowknife Dene First Nation (N'Dilo and Dettah).

CONTACT:

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RATIONALE:

Health, body condition, and disease and parasite status of barren-ground caribou provide important information on the status of the herd and on the potential for population growth. Samples taken from animals harvested for health assessment permit current levels of environmental contaminants to be determined and trends over time assessed.

OBJECTIVES:

- To collect information on the health, diseases and parasites of Bathurst caribou to assess current status and monitor trends over time;
- To collect information on body condition of caribou on the Bathurst range;
- To collect information on the presence of environmental contaminants in caribou, and to assess current exposure and trends over time; and
- To compare this information to previous information from the Bathurst caribou herd and other caribou herds across the north using a standardized protocol developed by the CircumArctic Rangifer Monitoring and Assessment Network (CARMA), and previous collections by Government of the Northwest Territories (GNWT) Environment and Natural Resources (ENR).

METHODS:

Health, condition and contaminant sampling was conducted on caribou harvested by community hunters on the Bathurst caribou range in late winter of 2010. A field camp was established based on the location and distribution of caribou, determined by location of collars and advice from the communities. Local hunters harvested and butchered the caribou, and sampling was conducted on each animal.

Information requested and collected consisted of the following:

- Date and Location of the harvest
- Sex
- Field age estimate
- Pregnancy status
- Field condition assessment
- Back fat measurement
- Record of any diseases or abnormalities
- Any other observations
- Lower jaw collection with the incisor teeth for aging
- Kidney (one per animal) collection for condition and contaminant analysis)

RESULTS AND MAIN CONCLUSIONS:

Total caribou sample kits submitted: 52

Sample Collection Timing:

42 harvested between January 25 and February 5, 2011 (Lockhart Lake and Drybones Lake)

10 harvested on March 26/27, 2011 (Lockhart Lake and Mackay Lake)

Sex composition of harvest:

31 females, 19 males, 2 not identified

Estimate of Age (hunters): Teeth submitted to Matson's Laboratory for exact age determination by cementum analysis; results expected later in the year.

Cows: 19 adults (3 young adults, 11 moderate adults, 5 old adults), 2 yearlings, 10 not recorded

Bulls: 16 adults (8 young adults, 1 moderate adult, 7 old adults), 3 not recorded

Field Assessment of Condition (hunters): An assessment of the body condition of each caribou was done by hunters using a subjective condition score with four categories (skinny, not bad, fat and very fat). Hunter assessments suggested caribou were generally in good body condition for the age, sex and time of year, with a range in condition scores for each sampling interval.

Cows: Very fat 2; Fat 11; Not bad 10; Skinny 4; Not recorded 4

Bulls: Very fat 1; Fat 1; Not bad 12; Skinny 4; Not recorded 1

Back Fat Measurements: Back fat measurements were taken by hunters by measuring the thickness of fat over the back at the base of the tail.

Adult cows (n=26mm): mean 4.4mm (range 0-22mm)

Adult bulls (n=16mm): mean 4.6mm (range 0-18mm)

Kidney Fat: Kidney Fat Index (KFI) is a widely used measurement used as an indicator of abdominal fat reserves (Harder and Kirkpatrick 1994). Kidneys were evaluated using a standardized technique to provide a ratio of the weight of the kidney X 100; the FKI is reported as a percentage and can be >100%. The amount of kidney fat was variable within and between sampling periods, with all animals having some amount of kidney fat stores.

Adult cows (n=26): mean 63.9% (range 33.6 - 89.1%)

Adult bulls (n=16): mean 28.3% (range 8.7 - 79.6%)

Pregnancy Rates: Pregnancy rates were determined in late winter by the presence of a fetus.

Adult cows: 21/26 (80.77%)

LONG-TERM PLANS AND RECOMMENDATIONS:

These initiatives are part of the monitoring actions identified in the Bathurst Caribou Management Plan (2004) and the long term objective is to continue to assess health and condition of caribou using a less detailed sampling protocol that can be carried out at the community level.

COMMUNITY INVOLVEMENT:

Information from the communities was used to help select a site where caribou will be collected. We worked with hunters in the field to discuss the health and condition of caribou that were collected and tested.

Photo: J. Nagy

Caribou are one of the most important resources in the Northwest Territories.

Continued Monitoring of the Bathurst and Bluenose-East Caribou Herd

LATE WINTER 2011

MAIN INVESTIGATOR:

Bruno Croft, Manager Research and Monitoring,
Environment and Natural Resources,
GNWT, North Slave Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL006879

LOCATION:

The late winter 2011 composition survey took place between April 4-7, 2011 and most of the caribou classified were located within 50 km west of Gamètì, 100 km NE of Hottah Lake, 70 km east of Gamètì and the area around Wekweètì, NWT.

PARTNERS:

- Tłı̨chǫ Government
- Community participants from Gamètì, Whatì and Wekweètì

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RATIONALE:

Monitoring and documenting overwinter calf survival provides a measure of net recruitment of new animals into the caribou herd and is one important indicator to assess status of a caribou herd. The monitoring action is conducted every year in late March and/or early April.

OBJECTIVES:

- To determine movement and distribution of the caribou and;
- To determine spring calf survival.

METHODS:

A preliminary fixed-wing reconnaissance survey is conducted first to determine locations of caribou in relation to collared cows. Once caribou numbers and location are determined, a crew of biologists and community observers classify caribou after using a helicopter to land near animals. Spotting scopes and/or powerful image stabilizer binoculars are used by the field crew.

RESULTS AND MAIN CONCLUSIONS:

For the Bathurst herd, 2,669 caribou were classified in late winter and the calf:cow ratio was 46 per 100.

For the Bluenose-East herd, 5,846 caribou were classified in late winter and the calf:cow ratio was 41 per 100.

LONG-TERM PLANS AND RECOMMENDATIONS:

The late winter and fall composition surveys are two important indicators of population status and will be continued on an annual basis until a solid recovery of the herd is demonstrated.

COMMUNITY INVOLVEMENT:

Information from the communities was used to interpret movements and locate caribou for spring and fall composition counts. Aboriginal hunters were part of the survey teams to help assess overall condition of animals classified.

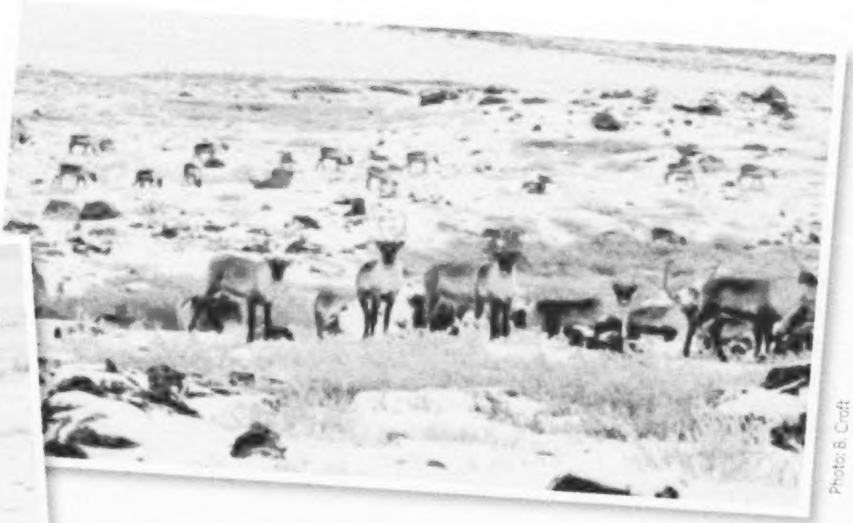

Photo: B. Croft

Photo: B. Croft

Caribou observation.

Dehcho Boreal Caribou Population Monitoring

SEPTEMBER 28, 2010
TO SEPTEMBER 30, 2011

MAIN INVESTIGATOR:

Nic Larter, Regional Biologist,
Environment and Natural Resources,
GNWT, Dehcho Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL005031

LOCATION:

This is an ongoing study, initiated in March 2004, that has increased in size and scope to include the traditional areas of eight Dehcho First Nations and includes that area of the Dehcho Region east of the Mackenzie Mountains. The study area is adjacent to the North and South Cameron Hills study areas where female boreal caribou have been collared by the South Slave ENR.

RATIONALE:

Oil and gas exploration is anticipated to continue and increase in the future, especially with the proposed Mackenzie Gas Pipeline. To ensure informed landuse decisions are made in regard to the maintenance of boreal caribou populations in the Dehcho, radio collars were deployed on female boreal caribou starting in March 2004.

A combination of satellite, GPS and VHF collars have been deployed on female boreal caribou to document seasonal range use, seasonal movements, detailed daily movements, and fidelity to calving areas of female caribou over multiple years in areas of boreal caribou range which have had limited to moderate fire and seismic disturbances. Collars and the annual spring classification survey provide estimates of calf and adult female survival as well as calf production which provide annual estimates of the rate of population change.

These data will be used to monitor the population and determine habitat use and habitat requirements, assist in the delineation of secure and critical habitat, and to assess impacts of potential resource development. More specific details are available in the annual Dehcho Boreal Caribou Progress Report, April 2010.

(www.enr.gov.nt.ca/_live/documents/content/ProgRep6_Dehcho_Boreal_Caribou_Study_AbsoluteFinal.pdf)

OBJECTIVES:

- To monitor annual calf production, calf survival, and adult survival in order to make annual estimates of lambda (λ);
- To ensure that the distribution of collared boreal caribou covers key areas throughout the range of boreal caribou in the Dehcho region;

- To determine the calving period and the degree of fidelity of female caribou to calving areas over multiple years in areas with a range of seismic and fire disturbance history;
- To use location data of female boreal caribou over multiple years overlaid with the current human footprint and wildfires to determine areas of high use and areas of avoidance by female boreal caribou in the landscape, and whether there is a seasonal component;
- To provide empirical data to determine areas of secure boreal caribou habitat, given the current human footprint, and to compare this to the predictions and robustness of the study completed to predict high value boreal caribou habitats in the Dehcho;
- To provide current knowledge of boreal caribou ecology for use in evaluating landuse applications made in the Dehcho;
- To provide empirical data for RSF modeling to assist with assessing important habitat types/areas;
- To assess responses of female caribou in relation to their use of space in the landscape as development occurs; and
- To continue to document and assess disease and parasites in boreal caribou.

METHODS:

An aerial spring classification survey was conducted where we locate all collared caribou and classify all animals associated with all groups of caribou seen. We specifically check to see if collared females have calves because we know how many female caribou had calves in the previous May.

All location data was cleaned and added to the database. Maps indicating the area used by each individual collared female caribou are produced on a quarterly basis and distributed to our First Nations partners.

Based upon an agreement with our First Nation partners there will be no collar deployment this year but location data will continue to be collected and analyzed to determine calving events and there will be a spring aerial classification survey to document overwinter survival of calves. Dropped collars will be retrieved if the opportunities arise. Collars will be purchased and refurbished for deployment in February 2012 to maintain an adequate number of functioning units on females in the population.

RESULTS AND MAIN CONCLUSIONS:

Location data was received and calving events were determined based upon movement data. A spring classification survey was conducted, 161 caribou were classified. Demographic parameters were estimated. Adult survival and calf overwinter survival have been greater than in previous years but the population shows an overall decline from when the study was initiated. More details can be found in the Dehcho Boreal Caribou Progress Report, April 2011.

(www.enr.gov.nt.ca/_live/documents/content/ProgRep7_Dehcho_Boreal_Caribou_Study_March11_v2.1.pdf)

The caribou are relatively free of diseases and parasites. See:

Johnson, D., N.J. Harms, N.C. Larter, B.T. Elkin, H. Tabel and G. Wei. 201[illegible] Serum biochemistry, serology and parasitology of boreal caribou (*Rangifer tarandus caribou*) in the Northwest Territories, Canada. *Journal of Wildlife Diseases* 46: 1096-1107.

Presentations of some of the work were made at the 13th North American Caribou Workshop in Winnipeg:

PARTNERS:

- Environment Canada provided funding assistance.
- First Nation partners include Sambaa K'e Dene Band, Liidlii Kue First Nation, Fort Simpson Métis Local, Jean Marie River First Nation, Pehdzeh Ki First Nation, Nahanni Butte Dene Band, Acho Dene Koe Band and Ka'a'gee Tu First Nation.

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Allaire, D.G., N.C. Larter, and the Sambaa K'e Dene Band. 2010. Combining Traditional and Scientific knowledge: a Mbedzih (woodland caribou) field study by the Sambaa K'e Dene Band. Poster presented at 13th North American Caribou Workshop, Winnipeg, MB.

Larter, N.C., J.A. Nagy and D.G. Allaire. 2010 Alternate prey, predators, and linear development: their effects on the use of space by boreal caribou in the Dehcho, NWT. Poster presented at 13th North American Caribou Workshop, Winnipeg, MB.

LONG-TERM PLANS AND RECOMMENDATIONS:

Monitoring of collared caribou will continue through the life of the collars that have currently been deployed to better refine local and landscape seasonal patterns of use over extended periods of time. Detailed analyses are currently being conducted with results to be used for environmental assessments of landuse activities among other things. An annual report of the program is being prepared. Additional collars are to be deployed in February 2012 to ensure that there are at least 30 functioning collars on female boreal caribou annually.

COMMUNITY INVOLVEMENT:

This year community involvement was limited because it had been mutually agreed that there would be no collar deployment for a year.

The program was reviewed and critiqued by First Nations delegates at the 5th biannual Dehcho Regional Wildlife Workshop in October 2010. There was consensus that collars would be deployed on female caribou in February 2012.

Photo: D. Allaire

Boreal caribou can be found in small groups throughout the Dehcho region.

Aerial Surveys of the Prairie Creek Mine Access Road for Caribou

SEPTEMBER 10, 2010
TO NOVEMBER 30, 2011

MAIN INVESTIGATOR:

David Harpley, P. Geoscience,
Canadian Zinc Corporation

WILDLIFE RESEARCH PERMIT NUMBER:

WL005033

LOCATION:

Prairie Creek Mine; approximately 90 km southeast of Nahanni Butte, NWT.

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RATIONALE:

Canadian Zinc Corporation's (CZN) access road links the Prairie Creek Mine to the Liard Highway near Nahanni Butte, and crosses terrain that may not be significantly used by caribou populations. As part of the environmental assessment for mine operations (EA0809-002), CZN was asked to provide additional information to verify that this is the case. Specifically, CZN has been asked to conduct three surveys along the route and adjacent areas over the 2010/2011 winter, survey timing to be approximately November 2010, February 2011 and March 2011.

OBJECTIVES:

- To determine if caribou congregate in any significant numbers in proximity to the access road alignment. Previous survey and anecdotal evidence indicates this is not the case. Structured surveys are planned to provide additional confirmation.

METHODS:

A fixed wing Cessna 185 will be used for the surveys. The access road alignment will be flown using hexagon blocks along the route. The route will be flown in short segments, with logging using GPS. The adjacent "buffer" area and further out will be flown using larger blocks. The survey will focus on the identification of caribou tracks rather than animals as these can be difficult to see.

RESULTS AND MAIN CONCLUSIONS:

December 2010 survey results:

Approximately 1,564 km of survey lines were flown over three days. A total of 62 caribou, 48 moose, 13 bison, and 7 Dall's sheep were observed during flights. Tracks of caribou (n=13), moose (n=6), grey wolf (n=3), wolverine (n=2). Red fox (n=1) and river otter (n=1) were also observed during survey flights. Caribou and caribou sign were detected in ten of the hexagon survey units. Observed caribou were usually in groups (range 4 to 15 animals) with few lone individuals observed. No wildlife or wildlife sign was observed during the December 17, 2010 access road reconnaissance level fly-over.

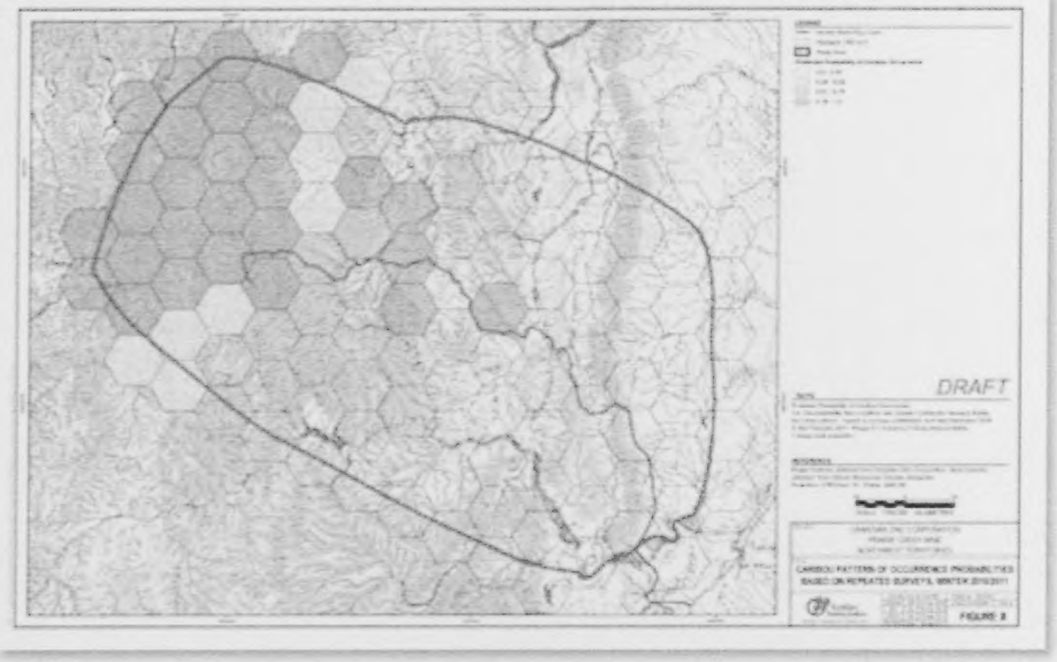
February 2011 survey results:

Approximately 2,200 km of survey lines were flown over four days. A total of 89 caribou, 31 moose, and 3 bison were observed during flights. Tracks of caribou (n=73), moose (n=222), grey wolf (n=21), bison (n=6), lynx (n=3) and wolverine (n=1) were observed during survey flights. Caribou and caribou sign were detected in 20 of the hexagon survey units. Wildlife tracks observed on or immediately adjacent to the access road alignment during the reconnaissance level fly-over consisted of caribou, moose and wolf. Snowmobile tracks (n=4) were observed in the southeastern portion of the study area.

LONG-TERM PLANS AND RECOMMENDATIONS:

The results from this survey, in conjunction with the December 2010 survey results and one additional survey to be completed by March 31, 2011, will be used to estimate the probability of occurrence of caribou in the study area. A complete description of survey methods and results will be provided in a report following completion of all three aerial surveys in the study area.

Predicted locations of caribou occurance.


DRAFT
CARIBOU PATTERNS OF OCCURRENCE PROBABILITIES BASED ON REPEATED SURVEYS, WINTER 2010/2011
FIGURE 3

Moose Abundance and Composition Survey

MARCH 2011 TO MAY 2011

MAIN INVESTIGATORS:

Kristen Callaghan, Gwich'in Renewable Resources Board and Tracy Davison, Regional Biologist, Environment and Natural Resources, GNWT, Inuvik Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL007420

LOCATION:

The survey took place within the Gwich'in Settlement Area and Inuvialuit Settlement Region within the ENR Inuvik region.

PARTNERS:

Funding was provided by Gwich'in Renewable Resources Board, Environment and Natural Resources, Inuvialuit Wildlife Species Fund, and by Aboriginal Affairs and Northern Development Canada's Cumulative Impact Monitoring Fund.

Many thanks to the Gwich'in Renewable Resource Councils and Inuvialuit Hunters and Trappers Committees, to workshop participants and to Kevin Allen, Douglas Esagok, Allen Firth, Cheryl Greenland, Samuel McLeod, George Niditchi, Elvis Raddi and Steven Tetlichi for their keen eyes and patience in the air.

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RATIONALE:

Moose (*Alces americanus*) is a year-round resident and an important food species for many citizens of the Gwich'in Settlement Area and Inuvialuit Settlement Region. This survey provides moose population density, but also gives important insights related to the influence of habitat characteristics and human-related disturbances on moose. Collecting baseline data in regions of future development is also an important component to assessing potential and cumulative impacts of those projects. Survey results will serve as a management tool for wildlife managers.

OBJECTIVES:

- To obtain an estimate of moose density in the study area; and
- To obtain data on moose composition and data.

METHODS:

A stratified random block survey design was used, modified from Gasaway et al. (1985). Survey areas were stratified into grid cells of high and low moose density using information from community members and vegetation covers. Survey grids were selected randomly and flown in March 2011. A pilot, navigator and two observers spotted and classified moose inside each selected grid cell and noted any moose observed outside selected cells. Wolves and other wildlife observations inside or outside selected grids were also recorded. Density estimates were made for each of the eight survey blocks based on total number of moose sighted in selected grid cells.

RESULTS AND MAIN CONCLUSIONS:

Survey flights were conducted from March 16 to March 24 for a total of 61.9 hours flown. A total of 168 moose were observed: 79 within surveyed grid cells and 89 moose outside surveyed cells. Of the total moose observed, 106 were classified and 62 were not. Of the classified animals 40 cows, 32 calves and 34 bulls were observed, resulting in bull to cow and calf to cow ratios of 85:100 and 80:100, respectively. In addition to moose, 33 sheep, 38 wolves and five caribou were observed.

LONG-TERM PLANS AND RECOMMENDATIONS:

Informed participation of knowledgeable community members and harvesters in the stratification of survey areas is important to improve accuracy of population estimates. It is possible that natural low densities make it difficult to detect trends between surveys. Composition estimates would be improved if surveys are conducted before bull moose shed their antlers. Information on moose habitat, recruitment and mortality as well as increased coverage of future surveys would help to increase precision and confidence of estimates and would help to explain changes in moose distribution, density and number.

COMMUNITY INVOLVEMENT:

Community workshops were held with local RRCs and HTCs to define the survey region and map areas of expected high and low moose density. Community members were also employed as observers for the survey, to spot and classify moose from the aircraft.

Moose bedded down

Photo: K. Callaghan

Monitoring Moose Population in the Dehcho

SEPTEMBER 2010 TO SEPTEMBER 2011

MAIN INVESTIGATOR:

Nic Larter, Regional Biologist,
Environment and Natural Resources,
GNWT, Dehcho Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL005030

LOCATION:

The aerial geospatial survey is conducted throughout the Mackenzie and Liard Valley drainages with *ca.* 16 km^2 block sampling units picked from the areas indicated on the map.

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RATIONALE:

Moose is an important traditional food resource for residents of the Dehcho. Baseline ecological data on moose are lacking. Oil and gas exploration is anticipated to continue and increase in the future, especially with the proposed Mackenzie Gas Pipeline. Local residents requested information on the abundance and distribution of moose and the health and condition of moose they harvest in the Dehcho prior to any large-scale development.

OBJECTIVES:

- To annually monitor the density and distribution of moose in areas of the Mackenzie River and Liard River Valleys, including the proposed Mackenzie Gas Pipeline right-of-way;
- To get annual estimates of cow:calf and bull:cow ratios in early winter (after the fall hunt) in the Mackenzie and Liard River Valleys; and
- To collect biological samples from harvested moose to assess health and condition and address local concerns about contaminant levels of a primary country food source.

METHODS:

This is an ongoing study monitoring baseline population demography and the health and condition of moose harvested in the Dehcho.

Geospatial aerial surveys involve total counts of animals within 16 km^2 blocks of land. Blocks are stratified into low and high density areas and those blocks flown are randomly selected. Approximately 45 blocks are flown in the Mackenzie Valley and 25 blocks are flown in the Liard Valley.

A variety of biological samples have been collected from harvested moose (including organ samples) throughout the course of the study. Samples have been forwarded to various labs to determine disease and parasite presence, levels of various elements, and ages. Marrow fat analyses have been conducted in house. Submission of biological samples is currently on a voluntary basis.

RESULTS AND MAIN CONCLUSIONS:

Geospatial survey techniques in November have provided baseline monitoring of demographic measures. Density estimates and cow:calf ratios have been relatively consistent over time. Localized distribution of moose has been affected by delayed freeze up in some years. A poster of the large-scale survey was presented at the 40th North American Moose Conference.

A paper describing the monitoring program was published in *Alces* 45: 89-99.

Harvested animals are healthy with low presence of parasites and disease. Levels of various elements found in moose harvested from the Mackenzie and Liard River Valleys are similar to those found in moose elsewhere. However, cadmium levels found in moose harvested from the southern Mackenzie Mountains were high. A public health advisory on the consumption of moose organs in the Dehcho was issued based upon our findings. Also a plain language poster of the cadmium levels and moose consumption as a country food will be published for distribution in the Dehcho.

Posters have also been presented at 43rd North American Moose Conference and Workshop and 15th Northern Contaminants Program Results Workshop. Additional reports and publications are being drafted.

LONG-TERM PLANS AND RECOMMENDATIONS:

A repeat large-scale survey is required by winter 2011. As a long-term goal, a detailed report showing the results of the contaminants analyses will be published. Biological samples from harvested moose need to be actively acquired over the next few years so that the level of contaminants can be assessed in relation to the levels found from samples collected from moose harvested 2005-2007.

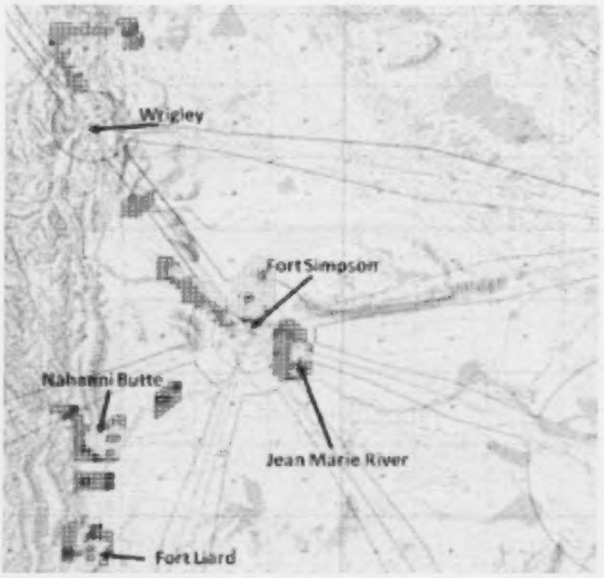
COMMUNITY INVOLVEMENT:

All six First Nation partners were involved in the delineation and stratification of the original large-scale geospatial aerial surveys of the Mackenzie and Liard River Valleys conducted during winter 2003-04.

Based upon First Nations requests the smaller areas shown on the map were delineated for subsequent smaller scale annual winter monitoring aerial surveys.

Members from local First Nations are hired as observers for all monitoring aerial surveys.

Community harvesters provide biological samples from harvested moose.



Study block sampling units.

Geospatial Moose Surveys in the Dehcho

NOVEMBER 2011

MAIN INVESTIGATOR:

Nic Larter, Regional Biologist,
Environment and Natural Resources,
GNWT, Dehcho Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL005036

LOCATION:

As part of an ongoing study monitoring population demography and the health and condition of moose harvested in the Dehcho, this large-scale geospatial aerial moose survey will estimate moose density and distribution over approximately 32,000 km^2 of the Dehcho; *ca.* 23,000 km^2 along the Mackenzie River valley drainage and *ca.* 9,000 km^2 along the Liard River Valley drainage.

PARTNERS:

Aboriginal Affairs and Northern Development Canada (AANDC) provided additional funding through Cumulative Impact Monitoring Program.

First Nation partners include Liidlii Kue First Nation, Fort Simpson Métis Local, Jean Marie River First Nation, Pehdzeh Ki First Nation, Nahanni Butte Dene Band, and Acho Dene Koe Band.

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RATIONALE:

Moose is an important traditional food resource for residents of the Dehcho. Baseline ecological data on moose are lacking. Oil and gas exploration is anticipated to continue and increase in the future, especially with the proposed Mackenzie Gas Pipeline. Local residents requested information on the abundance and distribution of moose and the health and condition of moose they harvest in the Dehcho prior to any large-scale development. The first large-scale geospatial survey of the Dehcho was conducted in winter 2003-04. Because moose are associated with more successional habitats there is a need to conduct these large-scale surveys every five to six years. By November 2011, eight years had passed since the last large-scale survey. This permit is specifically for conducting large-scale geospatial surveys along the Mackenzie and Liard River drainages.

OBJECTIVES:

- To annually monitor the density and distribution of moose in areas of the Mackenzie River and Liard River Valleys, including the proposed Mackenzie Gas Pipeline right-of-way;
- To gather annual estimates of cow:calf and bull:cow ratios in early winter (after the fall hunt) in the Mackenzie and Liard River Valleys;
- To collect biological samples from harvested moose to assess health and condition and address local concerns about contaminant levels of a primary country food source; and
- To assess the need for the annual small-scale survey program during the period between the large-scale surveys.

METHODS:

Geospatial aerial surveys involve total counts of animals found within blocks of land of *ca.* 16 km^2. Blocks are stratified into relatively low and relatively high density areas for finding moose in winter. About 80% of the blocks that are flown are randomly selected by a computer. The remaining 20% are randomly selected from larger areas where no sample blocks were picked from the first 80%. Approximately twice as many blocks of relatively high moose density are flown compared to blocks of relatively low moose density.

We use a Cessna 185 as a survey aircraft with two observers in the rear seats and pilot plus one observer/recorder in the front seats. All wildlife seen whether in or out of a block is recorded.

Flight lines are made at about 200-250 m above ground level in such a way to complete a total count of moose in any survey block. The flight line is recorded as a track log in a handheld GPS and all wildlife observations are entered as waypoints. This allows us to accurately determine whether animals observed were inside or outside the block being surveyed. Moose are classified as either females, calves of the year, or males. Males are further broken down into three classes based upon size (small, medium, large).

Density estimates, female to calf ratios, and male to female ratios are all derived using geospatial population estimator software (Alaska Department of Fish and Game). Only moose observed within survey blocks are used to derive these estimates.

RESULTS AND MAIN CONCLUSIONS:

The survey was flown November 14-22, 2011.

A total of 188 blocks were surveyed; 84 high density and 37 low density in the Mackenzie and 45 high density and 22 low density in the Liard. This worked out to coverage of 8.3% for the Mackenzie and 12.5% for the Liard.

In total we saw 299 moose, 60 boreal caribou, 60 wood bison, and 10 wolves (both inside and outside the survey blocks). We saw 3 three female moose with twin calves.

Moose were relatively abundant in or near areas that had burned 15-20 years ago.

The final analysis and report on the survey results will be completed in 2012-2013.

LONG-TERM PLANS AND RECOMMENDATIONS:

A repeat large-scale survey should be scheduled for winter 2017. Small-scale surveys should continue to be conducted during the intervening years but these surveys could be conducted every two years rather than annually.

COMMUNITY INVOLVEMENT:

All six First Nation partners were involved in the delineation and stratification of the original large-scale geospatial aerial surveys of the Mackenzie and Liard River Valleys conducted during winter 2003-04.

Similarly, for the November 2011 surveys all six First Nation partners were involved. At the request of First Nations partners the survey area was modified to extend along the Liard River to the south into British Columbia and the Mackenzie River to the east. They requested a decrease in the Bulmer Lake coverage area and the survey area did not include any of the newly expanded Nahanni National Park Reserve. Local harvesters also assisted in delineating the strata.

Members from all six local First Nations were hired as observers for the geospatial surveys.

Moose Baseline Health Study in the South Slave Region

SEPTEMBER 2010 TO SEPTEMBER 2011

MAIN INVESTIGATOR:

Allicia Kelly, Regional Biologist,
Environment and Natural Resources,
GNWT, South Slave Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL004813

LOCATION:

South Slave Region, NWT.

PARTNERS:

- Deninu K'ue First Nation
- Environment and Natural Resources
- Fort Providence Resource Management Board
- Ka'a'gee Tu First Nation
- K'atl'odeeche First Nation
- NWT Métis Nation
- Resident moose hunters
- Salt River First Nation
- Smith Landing First Nation

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RATIONALE:

In the South Slave region, moose are one of the most important food animals to the communities. Diseases and parasites can have an important impact on individual and population health. In other jurisdictions, winter ticks (which appear to be expanding in range and numbers in the NWT) can have significant impacts on moose health. Understanding what types and levels of parasites and disease moose currently carry and the occurrence of new or emerging pathogens is an important first step in determining if parasites or disease pose any risk to moose populations in the South Slave region. Establishing contaminant levels in moose in the South Slave is also important to instill confidence in moose as a safe and healthy food choice.

OBJECTIVES:

- To determine the type and levels of parasites currently present, monitor for new or expanding parasites, and identify any potential issues for moose health;
- To establish baseline contaminant information in moose in the South Slave; and
- To collect baseline information on the age, body condition and health status of the collected animals.

METHODS:

This study depends on samples submitted by local hunters: fecal pellets, kidney plus fat, 5 cm^3 piece of liver, a 15 cm portion of long bone, a 5 cm^3 piece of muscle, and lower incisor bar. Hunters are also asked to supply basic information such as the condition, sex/age class, date and location of the harvested moose. We know that kidneys are valuable to harvesters, and that it requires extra effort to carefully fill out the data sheet, collect samples and especially to make sure samples taken in the summer and fall stay frozen. As compensation $50 is provided to harvesters that provide complete, valid sample sets.

These samples will provide data on indices of health and condition (marrow and fat content), disease and parasites (blood and fecal pellets), concentration of key contaminants (muscle or organ tissues), and age (teeth provide age, which is critical to assess contaminant levels that are known to bioaccumulate and thus vary over time).

Winter tick:

Posters are displayed in ENR offices and on community bulletin boards to raise awareness of winter tick and encourage people to report any observations of signs of winter tick. Posters are circulated in late winter each year when the effects of winter tick on moose are most likely to be noticed. Hunters are also encouraged to provide samples of ticks to their local ENR office if they harvest a moose with ticks. A database of observations of moose with ticks or evidence of ticks is maintained.

RESULTS AND MAIN CONCLUSIONS:

Fifteen samples were received during the 2010/2011 season. An update on this study was shared at the November 2011 Regional Wildlife Workshop.

LONG-TERM PLANS AND RECOMMENDATIONS:

This is a multi-year study. Baseline (for the study period) health and contaminant information will be described when a minimum of 30 samples, distributed across the region, have been received. This health and condition data will be used along with population data to help understand moose dynamics in the South Slave Region.

COMMUNITY INVOLVEMENT:

This project was initiated in response to a community-identified monitoring priority. Hunters from South Slave communities are invited to participate in the study. This program's success depends on active support from local harvesters.

Photo: A. Kelly

A small group of male moose wander through the bush

Moose Population Survey in the Slave River Area (Fort Smith and Fort Resolution Areas)

NOVEMBER 2011 TO DECEMBER 2011

MAIN INVESTIGATOR:

Allicia Kelly, Regional Biologist, Environment and Natural Resources, GNWT, South Slave Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL004826

LOCATION:

The moose survey area was selected to include harvesting areas used by community members from Fort Smith and Fort Resolution. Boundaries were based on ecological regions. The survey included the Taiga Plains Level III Slave (River) Lowlands and Slave Delta ecoregions and the Taiga Shield Level II Mid-Boreal ecoregion. The survey area encompassed previous Fort Smith and Fort Resolution moose census areas.

PARTNERS:

- Deninu K'ue First Nation
- Environment and Natural Resources
- Salt River First Nation
- Smith Landing First Nation
- NWT Métis Nation

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RATIONALE:

In the South Slave region, moose are the most important food animal to the communities. Updated information on moose populations is a priority for the communities of Fort Smith and Fort Resolution. Local First Nations, harvesters and community members have expressed concerns about the apparent decrease in moose in their traditional harvesting areas to Environment and Natural Resources (ENR) staff on several occasions. The last moose censuses were conducted in 1995 (Fort Resolution) and 1996 (Fort Smith). First Nation delegates at the 2009 Regional Wildlife Workshop requested that ENR once again conduct a moose population survey in the Slave River Lowlands.

OBJECTIVES:

To determine moose population abundance and composition in the survey area as well as sub-areas (previous moose survey areas and ecological regions).

METHODS:

The survey was designed and conducted using the geospatial survey method, which is used across the NWT and Alaska for moose surveys. We used a standardized NWT-wide moose survey grid based on 2° latitude by 5° longitude to define survey blocks (each approximately 16 km^2 in size). Survey blocks were stratified as high or low based on their likelihood to contain high or low density of moose. Randomly selected sample cells were then intensively surveyed using two fixed-wing aircraft (Cessna 185 and Found Bush Hawk).

RESULTS AND MAIN CONCLUSIONS:

A letter with preliminary results and map was provided to First Nations following the survey (December 2011).

Habitat assessment flights to assess habitat quality for moose were conducted from November 15 to 22

(17.6 hours). The survey was conducted between November 21 and December 5, 2011. We flew a total of 109 hours to intensively survey 184 survey blocks (20% of the total survey area). We observed 160 moose including 56 bulls, 63 cows, 6 unspecified adults, and 35 calves (including 3 sets of twins). This includes moose inside and outside of survey blocks and on ferry flights.

Geospatial population estimator (GSPE) software will be used to analyze the results. A population estimate will be calculated along with a density estimate, calf to cow ratios and bull to cow ratios. Population and density estimates will also be calculated for sub-areas including the areas surveyed in 1995 (Fort Resolution survey) and 1996 (Fort Smith survey) and for each ecological region.

LONG-TERM PLANS AND RECOMMENDATIONS:

A final report on this survey will be produced in 2012.

It is recommended that moose populations continue to be monitored in important harvesting areas.

COMMUNITY INVOLVEMENT:

This moose survey was conducted in response to community concerns regarding local moose densities. Local harvesters shared knowledge to help classify the survey blocks into high or low density based on the probability of each area to contain moose. Observers from Fort Smith and Fort Resolution participated in the survey, including members from Deninu K'ue First Nation, Salt River First Nation, and the NWT Métis Nation, ENR staff, and students in Aurora College's Environment and Natural Resources Technology Program.

Photo: A. Kelly

Observers from Fort Smith and Fort Resolution participate in the survey.

Wolverine DNA Sampling on the Central Barrens

JANUARY 2011 TO DECEMBER 2011

MAIN INVESTIGATORS:

Robert Mulders, Wildlife Biologist
(Carnivore and Fur Bearers),
Environment and Natural Resources, GNWT
in collaboration with BHP Billiton and Rio Tinto

WILDLIFE RESEARCH PERMIT NUMBER:

WL006880

LOCATION:

Areas surrounding Daring Lake, Ekati Diamond Mine and Diavik Diamond Mine.

PARTNERS:

- Environment and Natural Resources
- BHP Billiton
- Rio Tinto
- Yellowknives' Dene First Nation
- Integrated Ecological Research (John Boulanger)
- Wildlife Genetics International (Dr. David Paetkau)

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RATIONALE:

On the central barrens, activities relating to mining exploration and interest in expanding hunting opportunities are increasing.

Communities, governments, and wildlife monitoring agencies have expressed concerns over the potential adverse cumulative effects on wolverine populations, in terms of habitat loss, disturbance and increasing mortality. This concern is further highlighted as the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) has assessed wolverine as a species of special concern.

OBJECTIVES:

- To determine wolverine abundance and density estimates using a standard hair snagging sampling design; and
- To obtain demographic data to monitor long-term changes in the wolverine populations.

RESULTS AND MAIN CONCLUSIONS:

Wolverine hair snagging was completed in April 2011 within the BHP Diamond Mine, Diavik Diamond Mine and Daring Lake regional study areas. Genetic analysis was completed in December 2011. However, final reports are still pending and are expected for the mining study areas by September 2012, and for the Daring Lake and study design by November 2012.

LONG-TERM PLANS AND RECOMMENDATIONS:

Genetic results will be further analyzed in the fall to review optimum cell size, and to review options for modifying the current survey interval of every second year. For example, options and trade-offs of increasing the cell size, and possibly extending the DNA survey interval to every three years will be considered. It's expected that this hair snagging protocol will continue to provide a rigorous and useful survey technique for monitoring relative wolverine abundance on the central barrens.

Photo R Gau

Woverine have been assessed as a species of special concern by COSEWIC

Index of Abundance for Tundra-Denning Wolves

MAY 2010 TO MAY 2011

MAIN INVESTIGATOR:

Dean Cluff, Regional Biologist,
Environment and Natural Resources,
GNWT, North Slave Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL005690

LOCATION:

The study will focus on the central tundra region of the Northwest Territories and includes Aylmer and Clinton-Colden Lakes to the east, Pellatt Lake to the north, Point Lake, Greenstockings Lake and Jolly Lake to the west, and Mackay and Walmsley Lakes to the south.

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RATIONALE:

The barren-ground caribou management strategy recommended monitoring trends in predator abundance. Population sizes in wolves are notoriously difficult to estimate because wolves range over vast areas, exist at relatively low densities, have secretive behaviours, and limit their activity during daylight hours. Wolves that follow migratory barren-ground caribou add to the difficulty by having increased annual home range sizes.

Previous studies with radio collared wolves on the tundra have shown that mated pairs usually return to the same site each year. Determining den site occupancy annually over a large set of known wolf dens offers a way to monitor the population status of wolves in the Bathurst caribou herd range.

OBJECTIVES:

- To establish an annual relative abundance index for tundra wolves;
- To investigate wolf population response to changing caribou abundance; and
- To quantify the frequency of den site usage.

METHODS:

About 100 wolf den sites known from previous surveys are monitored each year in early to mid-June for activity. Each den site will be assessed if active from the air with a small fixed-wing airplane. Active den sites and survey routes are mapped to a 10 km x 10 km grid established for the NWT for spatial analysis for wildlife management surveys.

Recruitment of pups into the population is a significant factor in wolf population dynamics, which in turn is thought to reflect changes in caribou abundance. To count pups, an aerial survey of currently active wolf den sites is typically flown in mid- to late August with a small fixed-wing airplane. Ground observations of active den sites may be done in late summer where logistics permit to assess the accuracy of aerial counts.

Carcasses of harvested wolves will be collected in late summer, fall and winter from participating hunters. Necropsies of these carcasses of both male and female wolves offer an assessment of nutritional condition by measuring fatness. Reproductive tracts of breeding females will be examined for in utero pup counts to estimate potential average litter size. Litter sizes and body condition will be compared with previous years, especially from necropsy results from a decade ago when caribou numbers were higher.

The survey route has included den sites of unmarked and radio collared wolves in the past. Monitoring radio collared wolves has the advantage of greater certainty in finding relocated den sites and thereby a better understanding of den site fidelity.

RESULTS AND MAIN CONCLUSIONS:

Twenty-two active wolf dens were observed. At these 22 den sites, there were a total of 37 wolves. A majority (12) of the active den sites had only one adult wolf visible, while eight dens had two wolves present, one den with three wolves, and one den with six wolves. There were four sites where no animals were seen but there was suspicious activity (some digging or tracks). These sites were marked to be revisited later in the month; upon revisiting those sites on 27 and 28 June, none turned out to be active.

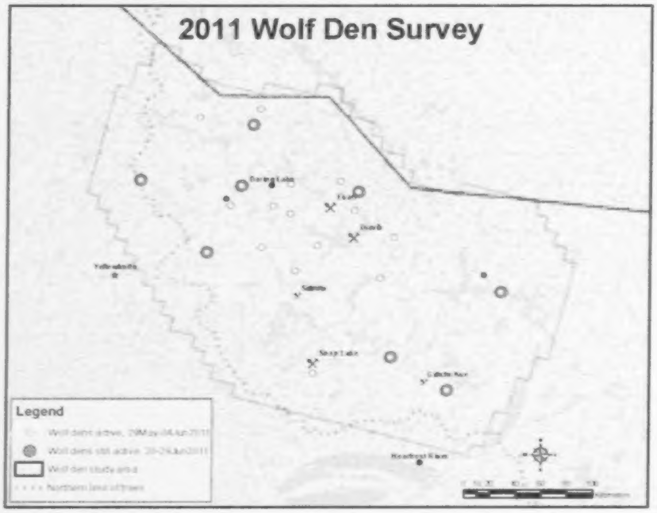
Active den sites tend to be 15 km or more apart in a given year. The number of wolves sighted at dens during these surveys has been dropping. Very few sites had more than the obligatory breeding pair of wolves present. Every year, there seems to be at least one den site with several accessory wolves, and this increases the variance among years. Despite this, the 90% confidence intervals surrounding the average number of wolves sighted at dens show a marked difference now compared to the late 1990s and early 2000s.

The follow-up survey on 27 - 28 June was to see how many dens were still active about four weeks later. Wolves may move their pups from dens to rendezvous sites but that's usually later in the summer, and often they're nearby. Many tundra denning wolves in the late 1990s and early 2000s did not move and remained at the same site.

This year about 36% (8 of 22 dens) are still active a month later. It does appear that wolf pup survival is low again this year and this low recruitment is one of the checks on wolf population dynamics when their food supply is low.

LONG-TERM PLANS AND RECOMMENDATIONS:

Continuation of surveying collared wolves is planned for the future; the frequency of these surveys will then be assessed. Collared wolves will be used to help determine if active whelping dens from the spring that are inactive in August are a result of relocation to a distant rendezvous site or complete litter loss.



Monitoring the Nahanni Wood Bison Population

APRIL 1, 2010 TO MARCH 31, 2011

MAIN INVESTIGATOR:

Nic Larter, Regional Biologist,
Environment and Natural Resources,
GNWT, Dehcho Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL005028

LOCATION:

This is an ongoing study monitoring baseline population demography and disease presence of the Nahanni wood bison population. The study was initiated in 2002. The population ranges over NE British Columbia (BC), SE Yukon Territory (YT) and the SW Northwest Territories (NWT) with the majority of the range in SW NWT along and adjacent to the Liard and lower reaches of the South Nahanni River Valleys.

PARTNERS:

- Environment and Natural Resources
- Government of British Columbia

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RATIONALE:

The Nahanni wood bison population was initially established with a transplant of bison to the area in June of 1980. Additional transplants in March 1989 and March 1998 augmented the population. Animals were documented dispersing south into BC soon after their release. An aerial population survey (March 2004) estimated 403 bison. Future population surveys will be required and appropriate survey timing and methodology will be crucial.

The Nahanni population is currently afforded a measure of protection against infection with *Brucella abortus* (causes brucellosis) and *Mycobacterium bovis* (causes tuberculosis) by maintaining a bison free zone to prevent contact with infected bison from Wood Buffalo National Park. Monitoring for these diseases through blood sample collections provide a measure of the effectiveness of the bison control program in addition to the assessment of disease status of the Nahanni bison population. Male only hunting was initiated in 1998 with one tag being allocated to each community of Fort Liard and Nahanni Butte.

Annual composition surveys provide data on calf production and juvenile overwinter survival and ratio of breeding age males to females. These data are useful for evaluating the impact of selective hunting, herd productivity, causes of death, and predation on calves, and population survey estimates.

Recently a combination of VHS, GPS, and satellite collars have been deployed on male and female bison to better identify animal movements, determine the frequency of river crossings, assess population range and seasonal range, determine animals frequenting communities, assess animal sightability in relation to aerial surveys, and to test the effectiveness of reflective collars along road corridors. Recent increased presence of bison in communities will require us to assess different measures to mitigate bison presence and any perceived threats to human safety.

OBJECTIVES:

- To measure calf, yearling, and bull:cow ratios during the post-calving period;
- To monitor annual calf production and estimate overwinter survival of calf bison;
- To collect biological samples as and when available from harvested animals or those involved in motor vehicle collisions;
- To document seasonal movement patterns and range use of male and female bison throughout the range;
- To document the frequency of river crossings by collared animals;
- To identify and monitor the presence, movements, and behaviour of bison in communities;
- To document the year round diet of Nahanni wood bison; and
- To monitor the Nahanni wood bison population for the presence of brucellosis, tuberculosis and Johne's disease.

METHODS:

In mid-July we conduct a boat-based survey of bison along the Liard and South Nahanni Rivers from the BC border to Blackstone. Bison are classified as calves, yearlings, cows, juvenile bulls, sub adult bulls and mature bulls. Fresh fecal samples are collected during the survey. Environment and Natural Resources (ENR) and biologists from Government of British Columbia participate in the survey.

Female and male bison are chemically immobilized following an approved ENR Wildlife Care Committee protocol in February/March. Three GPS and four satellite collars will be deployed on six females and one male. Blood samples get collected and analyzed for disease. Chemical immobilization is done by darting from a helicopter.

Blood samples will be collected from hunter-killed bison (community quota) and analyzed for the presence of *Brucella abortus* antibodies; teeth, fecals and lymph nodes will also be collected. Hunters will inspect carcasses for tuberculosis lesions or signs of brucella.

Any available biological samples will be collected from dead or euthanized animals resulting from collisions with motor vehicles or other accidents.

RESULTS AND MAIN CONCLUSIONS:

153 bison were classified in July 2010; the number of calves and yearlings/100 females and overwinter survival estimates were average.

Maps of the survey results were circulated to local First Nations.

One bison was harvested under quota; biological samples were collected from this animal.

Lab analysis of fecal samples was completed and the bison diet database was updated accordingly.

LONG-TERM PLANS AND RECOMMENDATIONS:

- Continued monitoring of population demography with another aerial survey to estimate the population is scheduled for March 2011.
- Continued collaboration with YT and BC Government on population monitoring and annual sex/age classification surveys is planned.
- Location data will be used to assess seasonal range use and assist in delineating areas of high use in the range.
- Location data will also be used to update the distribution of animals in the Nahanni wood bison population.
- Monitoring of collared wood bison and of animals frequenting communities will continue.

- ENR will work with communities to develop the NWT wood bison management strategy.
- Monitoring for disease and the collection of biological samples from hunter-killed, darted or deceased animals will continue as opportunities arise.

COMMUNITY INVOLVEMENT:

The project was initiated based upon community requests. Local residents have participated as river guides for surveys. Local residents are hired to assist with the collection of biological samples and distribution of meat from animals euthanized in or near communities. At annual community meetings and biannual Regional Wildlife Workshops the program is evaluated and critiqued by local First Nations and program comments are discussed and addressed. As part of the NWT Bison Strategy, bison working groups are being established in Nahanni Butte and Fort Liard.

Photo: D. Allaire

Surveying from the Liard River.

Photo: D. Allaire

Bison fitted with GPS collar.

Nahanni Wood Bison Population Survey

APRIL 1, 2010 TO MARCH 31, 2011

MAIN INVESTIGATOR:

Nic Larter, Regional Biologist,
Environment and Natural Resources,
GNWT, Dehcho Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL005032

LOCATION:

This survey is part of an ongoing study monitoring baseline population demography and disease presence of the Nahanni wood bison population. The study was initiated in 2002. The population range includes NE British Columbia (BC), SE Yukon Territory (YT) and the SW Northwest Territories (NWT) with the majority of the range in SW NWT. This permit is for a similar aerial population survey to be conducted in March 2011.

PARTNERS:

- Environment and Natural Resources
- Government of British Columbia

CONTACT:

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RATIONALE:

The Nahanni wood bison population was initially established with a transplant of bison to the area in June of 1980. Additional transplants in March 1989 and March 1998 augmented the population. Animals were documented dispersing south into BC soon after their release. The first aerial population survey (March 2004) estimated 403 bison. Future population surveys will be required preferably with a periodicity of once every five or six years and, due to the highly clumped distribution of bison occupying both open and heavily forested habitats during winter, these surveys will need to incorporate a sightability correction factor.

Annual July composition surveys provide data on calf production and juvenile overwinter survival, and ratio of breeding age males to females. These surveys have been conducted from 2002-2011. Data from these surveys indicate that it is unlikely that the population number has dramatically changed but it has been seven years since the last population estimate. A current population estimate for this population is important to contribute to the national recovery strategy for wood bison and to the NWT Bison Strategy.

Recently a combination of GPS and satellite collars have been deployed on male and female bison to better identify animal movements, determine the frequency of river crossings, assess population range and seasonal range, document animals frequenting communities, and most importantly assess animal sightability in relation to aerial surveys.

OBJECTIVES:

- To determine sightability correction factor for use in this and future Nahanni wood bison population surveys;

- To conduct an aerial strip transect survey and derive an estimate of the Nahanni wood bison population size based upon the survey results; and
- To document all wildlife observations during the survey in a digital format.

METHODS:

An aerial strip transect survey was flown 15-17 March in a fixed-wing Cessna 185 aircraft.

The flight crew consisted of two observers in the back seats, a pilot and a recorder observer in the front seats.

Parallel transects were flown approximately 3.5 km apart at approximately 120 m above ground level over the survey area.

The wing struts were marked with two lines such that each observer reported animals observed within a 500 m swath as on transect for all but heavily forested habitats.

For heavily forested habitats the observable width was 100 m either side of the aircraft.

The Liard Highway corridor was surveyed from the Fort Liard access to km 118 on Highway 77 (in BC).

All flight lines were track logged using a Garmin 76S Map global positioning system (GPS); waypoints were also recorded on GPS for all wildlife observed.

The front seat recorder also monitored for the presence of radio collared animals in groups observed or missed.

RESULTS AND MAIN CONCLUSIONS:

An area of 7,600 km^2 was surveyed by approximately 3,400 km of flight lines.

Six female and one male bison had been previously outfitted with radio collars and were used to determine a sightability correction factor.

A total of 186 bison were counted both on and off transect.

The population estimate is 413 bison (±213 95% confidence). This estimate is not different from the 2004 population estimate.

Seventy-nine moose, one otter and sign of two wolf packs were observed during the survey.

Maps and briefing notes of the survey results were circulated to local First Nations.

LONG-TERM PLANS AND RECOMMENDATIONS:

Continued collaboration with the YT and BC Governments on population monitoring and annual sex/age classification surveys is planned. Location data will be used to update the distribution of animals in the Nahanni wood bison population. There will be a need for collared animals in association with future population surveys as a measure of sightability is critical for properly interpreting survey results and deriving a population estimate for the Nahanni wood bison population. Surveys to estimate population size should be conducted every five to six years.

COMMUNITY INVOLVEMENT:

Local residents from Nahanni Butte and Fort Liard were hired as observers for the survey.

At annual community meetings and the biannual Regional Wildlife Workshop in 2010 the bison survey has been discussed.

Wildlife Health and Genetic Monitoring

JANUARY 1, 2011
TO DECEMBER 31, 2011

MAIN INVESTIGATOR:

Brett Elkin, Disease / Contaminant Specialist,
Environment and Natural Resources, GNWT

WILDLIFE RESEARCH PERMIT NUMBER:

WL005622

LOCATION:

NWT-wide.

PARTNERS:

- Local hunters and trappers
- Members of the general public
- Environment and Natural Resources: biologists and Renewable Resource Officers
- Canadian Cooperative Wildlife Health Centre
- Canadian Food Inspection Agency
- University of Saskatchewan Western College of Veterinary Medicine
- University of Calgary Faculty of Veterinary Medicine

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RATIONALE:

Although most wild animals are healthy, diseases and parasites occur in any wildlife population. Some diseases and parasites are naturally occurring and appear to cause little problem in their host, while others have the potential to impact wildlife at both the individual animal and population level. Some of these diseases and parasites can also affect people and domestic animals.

Samples from animals harvested by hunters and trappers, found dead, or handled during wildlife research or management activities by Environment and Natural Resources (ENR) staff, other wildlife agencies or university researchers can provide valuable health, condition and genetic information on wildlife populations. These samples provide an opportunity to monitor diseases and contaminants of particular importance to wildlife and human health, and to identify new and emerging diseases. Taking advantage of samples from these existing activities provides additional valuable information for making wildlife management decision and providing public information.

OBJECTIVES:

- To determine the cause of sick or dead wildlife found, harvested or handled by hunters, trappers, biologists, wildlife researchers, Renewable Resource Officers, or the general public.
- To assist hunters and trappers by testing samples from harvested wildlife to determine what diseases or parasites are present, and the implications for consumption of the carcass.
- To work co-operatively with hunters, trappers, biologists, Renewable Resource Officers and members of the general public to monitor the health and condition of wildlife on an on-going basis.
- To identify the types, relative levels and geographical distribution of diseases, parasites and contaminants found in wildlife across the Northwest Territories.

- To increase community awareness of diseases and parasites.
- To collect genetic information that will contribute to the understanding and management of wildlife populations.

METHODS:

Samples are collected in several different ways.

Local hunters, trappers and Renewable Resource Officers frequently submit samples from harvested wildlife. They generally provide detailed information on the animal and the particular case, and often provide additional information on the occurrence and patterns of similar cases within their harvest areas.

Members of the general public, wildlife biologists or Renewable Resource Officers may also submit samples from wildlife that are sick or found dead.

Samples from animals handled during wildlife research or management activities that may be submitted by biologists, technicians, other wildlife researchers or Renewable Resource Officers are also submitted for disease testing.

Whole animals or samples of the affected tissues or body parts are collected, as well as other samples necessary to determine health status, body condition and age.

Samples are analysed for diseases, parasites, contaminants, condition and/or genetics. In many cases, this requires the shipment of samples to specialised laboratories to determine the cause of the abnormality. Results of the testing are provided to the individual(s) who submitted the sample, and recorded in an NWT disease database to monitor disease trends across the NWT and over time.

RESULTS AND MAIN CONCLUSIONS:

Hunter submitted samples in 2011 (lab tested).

Samples Submitted for Disease Surveillance:

- Anthrax surveillance in Mackenzie Bison Sanctuary and Slave River Lowland June through August
- Barren-ground caribou health and condition surveillance: Bathurst, Beverly/Ahiak and Bluenose-East (159 tested)
- Brucellosis and TB surveillance in wood bison
- Intensive health assessment (16 bison)
- Hunter collected samples (~ 40 bison)
- Brucellosis screening in muskox (243 tested)
- Chronic Wasting Disease surveillance: white-tailed deer and caribou sampled
- Echinococcus surveillance - multiple species
- National avian influenza surveillance-birds (not detected)
- National west nile virus-birds and mosquitoes (not detected)
- Rabies surveillance (9 submissions, 6 positive)
- Trichinella surveillance - multiple species
- Toxoplasma surveillance - multiple species
- Contaminant testing in moose and caribou

Products Produced:

- Results reported to individual hunters and trappers
- NWT wildlife disease surveillance and database
- NWT rabies surveillance and database
- Participation in national Avian Influenza, West Nile Virus and CWD surveillance programs

LONG-TERM PLANS AND RECOMMENDATIONS:

Wildlife disease surveillance is ongoing every year.

Long term testing will continue on any hunter submitted samples, animals found dead, and the investigation of disease cases or outbreaks. Results of this testing will be used to provide information and recommendations to individual harvesters, the public, and wildlife management agencies and wildlife co-management boards.

COMMUNITY INVOLVEMENT:

Hunters and trappers frequently bring in samples or provide reports of diseases, parasites or abnormalities in harvested wildlife. Identification of the diseases or parasites involved in these cases can be important to make decisions on consumption of meat from the affected animal. Sick or dead animals are also found periodically in the wild, and testing is required to determine the cause of death and potential significance for other wildlife and people. Information provided by hunters and trappers on the occurrence of diseases and parasites can also be used to identify areas requiring further monitoring or testing.

Local hunters, trappers and members of the general public are encouraged to submit samples of any abnormalities they find in the wildlife they harvest. Results of testing are provided back to the individuals submitting the samples following diagnostic testing.

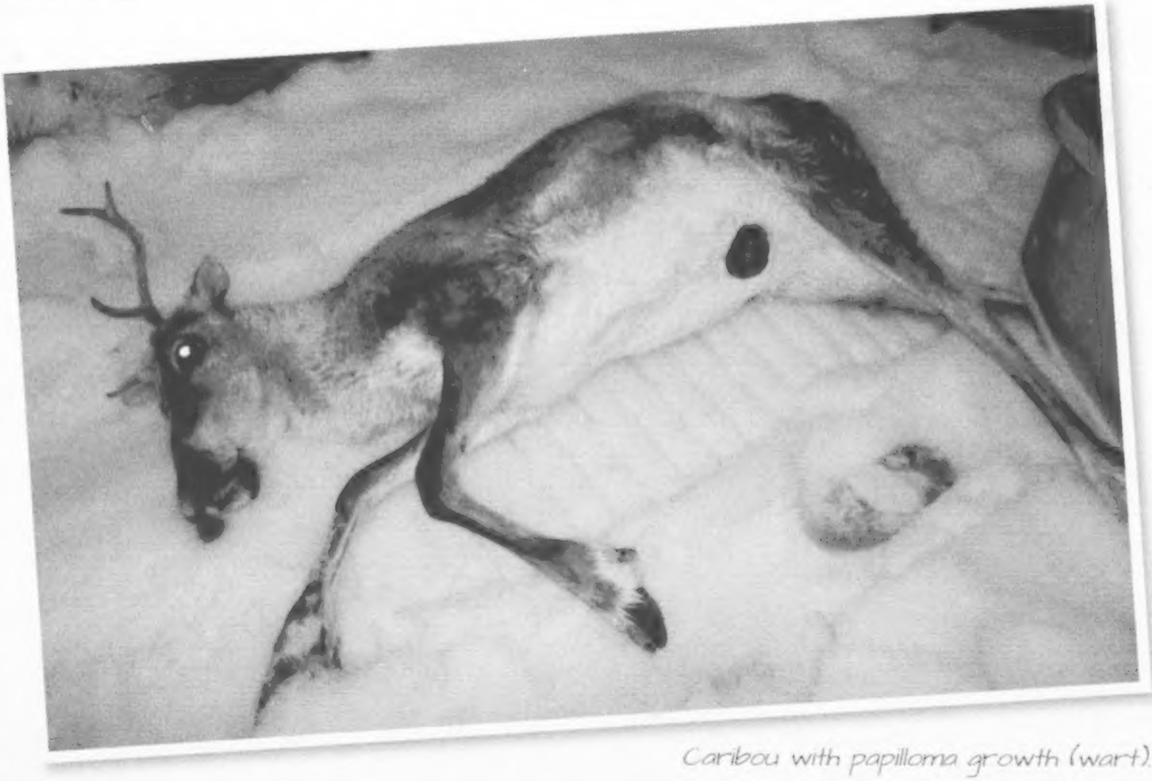
Photo: M. Branigan

Caribou with papilloma growth (wart).

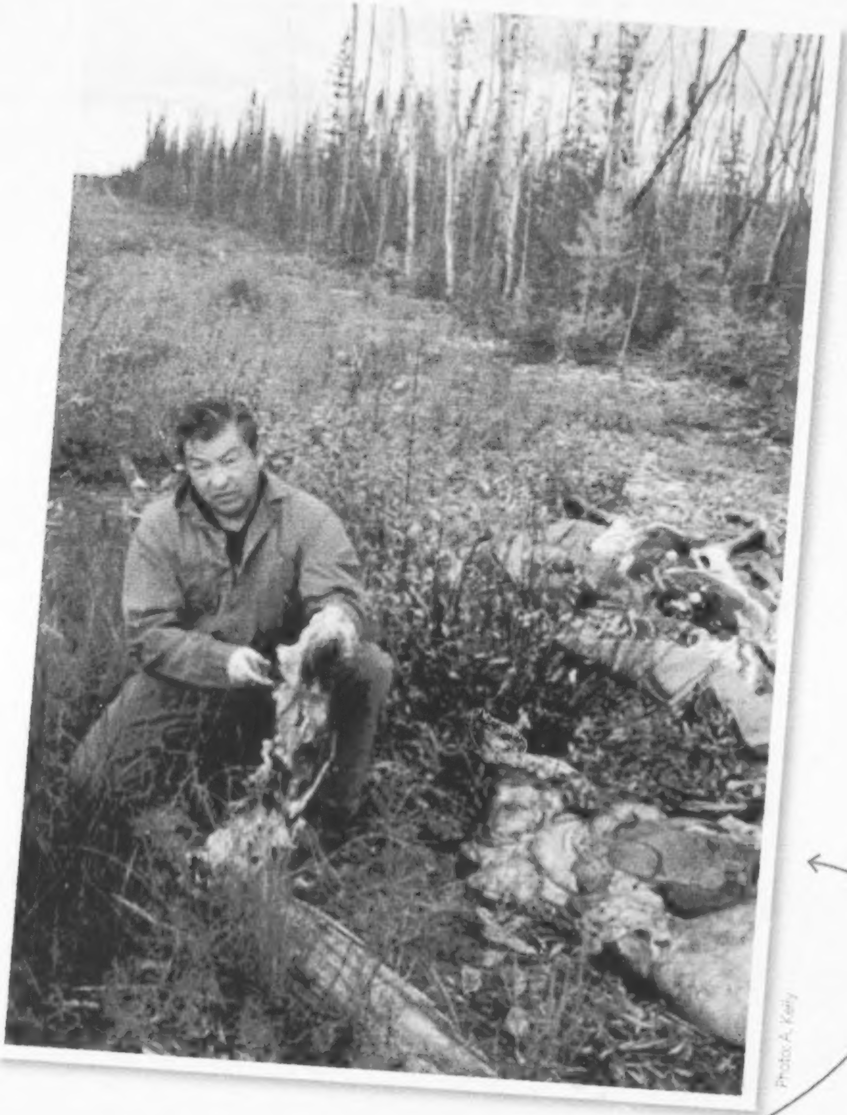

Photo: A. Kelly

Collecting tissue samples from a moose.

Community-based Monitoring of Wildlife Health

MAY 2010 TO MARCH 2011

MAIN INVESTIGATOR:

Dr. Susan Kutz, DVM Ph.D.,
University of Calgary

WILDLIFE RESEARCH PERMIT NUMBER:

WL005158

LOCATION:

Sahtu Settlement Region, NWT.

PARTNERS:

- Environment and Natural Resources
- Fort Good Hope Renewable Resources Council
- Sahtu Renewable Resources Board
- NSERC PromoScience (youth outreach components only)
- Additional funding from NSERC, Alberta Ingenuity, Northern Scientific Training Program, and Nasivvik Centre for Inuit Health

CONTACT:

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Faculty of Veterinary Medicine
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RATIONALE:

This program began in 2003 in response to community concerns about wildlife health under a regime of rapid environmental change (climate and industrial development) in the Sahtu Settlement Region, Northwest Territories. Community members indicated that they had concerns about the health and sustainability of wildlife, how wildlife health and disease may affect them, and that the next generation (youth) may not be adequately prepared to take on the emerging environmental issues in the region. Environmental and Natural Resources (ENR), together with the Faculties of Veterinary Medicine University of Saskatchewan (2003-2005) and University of Calgary (2005-present), in partnership with the Sahtu Renewable Resources Board, have run a program of outreach, education, and community based-monitoring of wildlife health since 2003. Wildlife health monitoring was initially focused on barren-ground caribou. In 2009 we added a moose monitoring program in response to concerns about moose health.

OBJECTIVES:

- To work with local hunters to maintain an ongoing wildlife health monitoring program that is responsive to the changing needs of the community and the changing health issues that emerge in wildlife.

METHODS:

We consulted with communities in 2009 and 2010 about caribou and moose health. One specific objective was to discuss naming of a new lungworm from caribou and muskoxen that was first discovered in the Sahtu. Elders and hunters in three communities were consulted with to suggest possible Slavey names for the parasite. With respect to moose, the apparent emergence of winter tick in the Sahtu was the main concern, however, community members also wanted to know more about the general health of moose.

From fall 2010 to spring 2012, 14 hunters submitted samples from a total of 37 moose. Samples requested included the metatarsus, blood on filter paper, the incisor bar, the kidney, a piece of liver, and the whole hide. Metatarsal bones were examined for *Onchocerca cervipedis*, a filarioid nematode found under the skin, and used to determine marrow fat. Blood was tested for *Neospora caninum*, *Toxoplasma gondii*, and a variety of bovine viruses. Hides were digested in a potassium chloride solution to look for winter ticks. In addition, as part of the ongoing caribou health sampling program, in 2011, barren-ground caribou from the Bluenose-East herd were also sampled.

RESULTS AND MAIN CONCLUSIONS:

The communities of Fort Good Hope, Tulıta, Délı̨ne and Norman Wells responded very positively to the program as demonstrated by the large number of moose samples submitted. The ongoing caribou monitoring program in Délı̨ne was successful with high quality samples collected from 25 barren-ground caribou. Some of the most interesting findings include:

For the first time at this northern latitude the parasite *Onchocerca cervipedis* was found on the metatarsal from 6 of 28 moose examined. These results, together with additional data from a community hunt out of Fort Good Hope and observations in Alaska and Yukon, demonstrate both new host (subspecies of *Rangifer tarandus granti* in Alaska and *Alces americanus* in Mackenzie Mountains) and geographic records for this parasite. A manuscript describing these findings is currently under review for publication.

Neospora caninum was found in moose using serology from filter paper blood samples collected by hunters. This is the first time moose in the NWT have been found positive for *Neospora*. All caribou tested (some samples from previous years) were negative for *Neospora*.

Dermacentor albipictus, the winter tick, was found on moose from Délı̨ne and Tulıta and from a small number of moose hunted near Fort Good Hope.

Hunters and elders of the communities actively participated in suggesting names for the new lungworm found in caribou in the Sahtu. The paper describing this lungworm is in preparation and the proposed species name is in the Slavey language and is based on the recommendations from the communities.

LONG-TERM PLANS AND RECOMMENDATIONS:

The wildlife health monitoring program has resulted in new findings on the health of caribou and moose in the Sahtu. The program has evolved and been refined over the years and provides long-term information on general health of targeted species and also provides a framework (trained and interested hunters, informed communities) for mobilizing capacity to address new health issues, for example winter tick.

Our initial work on moose in the Sahtu suggests that there is value in continued sampling of moose for the above mentioned parasites and starting to look in more detail at the potential impacts of these parasites. Both *Onchocerca* and winter tick are highly responsive to climatic conditions. *Onchocerca* is an insect transmitted filarioid nematode and although it is not reported to be causing disease in moose currently in the Sahtu, emergence of severe disease caused by related filarioid parasites in cervids in Finland has been associated with unusually warm weather. The range of winter tick appears to have already expanded significantly north in the NWT since the 1980s, likely linked to climate warming. Our preliminary modeling to predict the potential range for winter tick, based on current and future climatic conditions, suggests that it may still move further north. *Neospora caninum* is an important parasite that can cause abortion in bovids and cervids and the extent and potential impacts of this parasite in moose should be further explored.

The caribou health monitoring program should continue, but perhaps in a more targeted fashion to reduce workload on contributing hunters. Data on age, sex, and body condition should continue to be collected and diseases worthy of ongoing monitoring include both *Neospora* and winter tick – both of which may be able to colonize the barren-ground caribou and cause significant disease and population level impacts. Brucellosis, toxoplasma, cervid herpes virus, and para-influenza virus also are pathogens of potential importance in caribou that should be monitored on an ongoing basis. Monitoring of woodland caribou to date has not occurred in this program but may be considered a high priority given the small amount of information on the health of woodland caribou in the Sahtu.

Photo V Crichton

Moose are surprisingly well camoflaged and can move through the forest like ghosts.

COMMUNITY INVOLVEMENT:

The project was initiated because of community concerns and works with local hunters to collect samples but also to identify issues of concern. An annual youth outreach program, funded primarily by NSERC PromoScience, has been run in conjunction with the wildlife health monitoring program and involves interactive sessions on wildlife biology and wildlife health with youth in all grades in all schools of the Sahtu. Results are reported back to the communities at the annual Sahtu Renewable Resources Board meetings and also at individual community meetings. Richard Popko and Alasdair Veitch from Environment and Natural Resources, and Guilherme Verocai and Cyntia Kashivakura from the University of Calgary, Faculty of Veterinarian Medicine assisted with the project.

Photo: K. Kuker

Limited information is available on the health of the woodland caribou in the Sahtu Region

Small Mammal and Hare Surveys

JUNE 2011 TO SEPTEMBER 2011

MAIN INVESTIGATOR:

Suzanne Carrière, Wildlife Biologist (Biodiversity), Environment and Natural Resources, GNWT

WILDLIFE RESEARCH PERMIT NUMBER:

WL005764

LOCATION:

Sahtu

Norman Wells:	65° 18′ N; 127° 20′ W
Tulita:	64° 54′ N; 125° 34′ W *

North Slave

Yellowknife:	62° 24′ N; 114° 26′ W
Bliss Lake:	62° 34′ N; 113° 20′ W *
Gordon Lake:	63° 00′ N; 113° 10′ W
Daring Lake:	65° 00′ N; 111° 30′ W

Dehcho

Fort Liard:	60° 39′ N; 117° 29′ W *
Fort Simpson:	62° 00′ N; 122° 00′ W

South Slave

Fort Smith:	60° 01′ N; 111° 54′ W
Fort Resolution	61° 10′ N ; 113° 40′ W
Tsu Lake (Aurora College)	60° 35′ N; 111° 53′ W

Inuvik

Inuvik:	68° 18′ N; 133° 29′ W *

* Survey not performed in 2011 due to unavailable personnel.

All surveys were done between June 1 and August 31, 2011.

PARTNERS:

- Environment and Natural Resources (Government of the NWT)
- Deninu K'ue First Nation
- Sahtu Renewable Resources Board

OBJECTIVES:

The NWT small mammal survey (SMS) monitors changes in density of voles, mice, lemmings, and shrews across five ecozones in the territory. The hare transect survey (HTS) monitors snowshoe hare density across all forested ecozones.

METHODS:

Small mammal data is collected using snap-traps or live traps and reported as the number of trapped specimens per 100 trap-nights (capture index). Monitoring is done on standardized permanent trap lines. Usually, 100 traps are out for five nights. Trap lines are checked at least each morning before 10:00 a.m. The trapping is planned for August each year, but at some sites the survey is performed in June, July or September if other activities require a change in timing.

Hare data is collected on four transects at each site. Each transect consists of 20 permanent quadrats measuring 5.1 cm X 305.0 cm oriented along the transect and evenly spaced 15 to 30 m apart. Hare fecal pellets deposited within each quadrat are then counted and cleared from the quadrat. The number of pellets per quadrat is then correlated to an estimate of hare density (number of hare per hectares) at each site.

RESULTS AND MAIN CONCLUSIONS:

In summer 2011, small mammal numbers increased in most regions except near Fort Smith and Fort Resolution. Record numbers of small mammals were detected at Daring Lake, our only tundra site.

Peaks in hare numbers have occurred in the NWT every 10 years or so, in 1962, 1971, 1980, 1990, and then in 1999-2000. Hare populations across the NWT remained low between 2002 and 2006, but increased rapidly in 2009 and may have peaked in 2010. This latest peak is numbers in not as high as in previous decades. Lower peaks are also observed in the Yukon.

LONG-TERM PLANS AND RECOMMENDATIONS:

This survey is part of long-term efforts to monitor the natural fluctuations in both forested and tundra ecosystems in the NWT. Plans are to continue the survey and expand the number of sites depending on community advice and requests.

The information from both hare and small mammal surveys is used in many other projects including predicting furbearer abundance in the NWT. Other agencies or organizations also rely on results from the SMS and HTS to complement their studies.

In 2011, survey data were shared with researchers who are tracking environmental changes in the Yukon (C. Krebs, University of British Columbia).

COMMUNITY INVOLVEMENT:

Over the years, biologists from government, co-management board and non-profit organizations, Renewable Resources Officers, academic researchers, and environmental consultants have participated in data collection for both projects. At some sites, students assisted in data collection within research camps or school field courses.

Data from Tsu Lake camp (Aurora College) are now integrated into the NWT SMS and HTS. Historical data from that site have been collected by students in most years since 1989. The success of the NWT SMS and HTS is possible because of the combined efforts of all project participants.

Photo: C. Norman

Collecting small mammal data

- Gwich'in Renewable Resources Board
- Aurora College, Fort Smith

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Contacts and participants:

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Yellowknife: Suzanne Carrière (Biologist, ENR, Wildlife Division, GNWT), Michelle Tuma, Josh Sullivan, Ben Linaker, Chloe Smith, Dana Couturier, Carina Sartor-Pielak, (summer students from various divisions in ENR, Yellowknife) and Stephanie Yuill (Public Education, ENR, GNWT)

Bliss Lake: North Slave Office (not conducted)

Gordon Lake: Suzanne Carrière (Biologist, ENR, Wildlife Division, GNWT), Josh Sullivan (Student),

Daring Lake: Steve Matthews (Biologist, ENR, Wildlife Division, GNWT) and students at Daring Lake Tundra Science Camp

Fort Simpson: Danny Allaire (Wildlife Technician, ENR, Dehcho Region, GNWT) and Daniel Allaire (Forest Officer, ENR, Dehcho Region, GNWT)

Fort Smith: Karl Cox (Wildlife Technician, ENR, South Slave Region, GNWT), Terrance Campbell (GNWT South Slave Region),

Tsu Lake: Aurora College

Fort Resolution: Karl Cox (Wildlife Technician, ENR, South Slave Region, GNWT)

Inuvik: (Gwich'in Renewable Resources Board) (not conducted)

Photo: C. Norman

Snowshoe Hares

Photo: A. Allaire

Marsh Bird Surveys in Kwets'ootł'àà Candidate Area

SUMMER 2011

MAIN INVESTIGATOR:

Kevin Kardynal, Habitat Biologist,
Canadian Wildlife Service

WILDLIFE RESEARCH PERMIT NUMBER:

WL006888

LOCATION:

The Kwets'ootł'àà candidate protected area encompasses approximately 600 km^2 of the northern portion of Great Slave Lake's North Arm. It includes the mainland shoreline, numerous islands, and open water areas of the lake. The community of Behchokǫ̀ is located just outside the candidate area boundary to the northwest.

PARTNERS:

- Government of the Northwest Territories

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RATIONALE:

Kwets'ootł'àà is a candidate protected area under the NWT Protected Areas Strategy (PAS) and is part of the federal Completing Conservation Planning in the NWT initiative. It is a partnership between the Tłı̨chǫ Government, the community of Behchokǫ̀, the Canadian Wildlife Service (CWS), the Government of the Northwest Territories and several other stakeholders and is currently at Step 5 of the 8 step PAS process. As part of Step 5, an ecological assessment is conducted to identify the key ecological components in the candidate area before a final decision can be made to proceed with legally designating the site. This research was conducted as part of a Phase II Ecological Assessment.

OBJECTIVES:

To survey for marsh birds (e.g. American bittern and sora) and species at risk (e.g. yellow rail, olive-sided flycatcher, rusty blackbird and common nighthawk) present within the Kwets'ootł'àà candidate protected area.

METHODS:

Field work occurred in the Kwets'ootł'àà candidate protected area boundary between 7 to 14 June 2011. Playback songs of bird calls were used to increase detections of target species during evening and morning surveys done between 2300 hrs. and 0800 hrs. Survey sites were selected based on habitat preferences of target species (e.g. marsh habitat). Playback stations were spaced at least 400 m apart to avoid detecting birds heard at other survey locations. Incidental bird observations, both visual and audio, made during the surveys were also recorded to increase our understanding of species presence. Species and observation locations (GPS location) along with, when possible, sex and breeding status (lone or paired) was recorded for each individual.

RESULTS AND MAIN CONCLUSIONS:

Over the course of the survey period we observed a total of 147 birds at 48 survey locations within the Kwets'ootł'àà candidate protected area. Thirty-six different bird species were detected and included numerous waterfowl (ducks, geese, and swans), gulls, terns, raptors, shorebirds, songbirds and waterbirds.

Although marsh birds and species at risk were targeted during our surveys; low water levels resulted in few target species being detected. Of the species at risk with ranges that overlap the area, we detected one olive-sided flycatcher and six common nighthawks. We also located marsh dwelling sandhill cranes and common snipe. Also of note was the recording of an osprey during the surveys.

Ecological values within Kwets'ootł'àà are generally poorly known, including the spectrum of marsh birds and species at risk that use the area. This study builds on Phase I Ecological Assessment for this area focusing specifically on species at risk and marsh bird use. Due to the limited knowledge of the presence of these species in Kwets'ootł'àà, this study provides us with formerly unconfirmed species occupancy.

A Phase II Ecological Assessment is currently being completed and will include a detailed review of this research.

LONG-TERM PLANS AND RECOMMENDATIONS:

The information from this study will be used in the decision to proceed with the process to designate Kwets'ootł'àà as a National Wildlife Area, to determine a recommended final boundary, and to prepare a management plan for the area.

COMMUNITY INVOLVEMENT:

Moise Rabesca of Behchokǫ̀ provided guiding services and helped conduct marsh bird and species at risk surveys on the North Arm. All stakeholders with interests in the candidate protected area are involved in reviewing the Ecological Assessment through participation on the Kwets'ootł'àà Working Group.

Photo: S. Moore

North Arm of Great Slave Lake

Avian Species at Risk Surveys and Nest Searches in the Ka'a'gee Tu Candidate Protected Area

JUNE 2011

MAIN INVESTIGATOR:

Kevin Kardynal, Habitat Biologist,
Canadian Wildlife Service

WILDLIFE RESEARCH PERMIT NUMBER:

WL004822

LOCATION:

The Ka'a'gee Tu candidate protected area is located in the Dehcho Region of the Northwest Territories and surrounds the community of Kakisa, NWT.

Ka'a'gee Tu is bordered by Beaver Lake and Great Slave Lake in the northeast; the Cameron Hills and Dogface Lake in the south; and encompasses Kakisa and Tathlina Lakes.

PARTNERS:

- Ka'a'gee Tu First Nation
- Deh Gah Gotie First Nation
- K'atl'odeeche Dene Band
- Ducks Unlimited Canada

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RATIONALE:

Ka'a'gee Tu is being proposed to become a National Wildlife Area through the NWT Protected Areas Strategy (PAS) under the *Canada Wildlife Act*. The Canadian Wildlife Service, the Ka'a'gee Tu, Deh Gah Gotie and K'atl'odeeche First Nations and several other stakeholders are working together through this strategy to determine the value of protecting this area. As part of Step 5 of the NWT PAS, an ecological assessment is conducted to identify key ecological components in the candidate area before a final decision is made to proceed with legally designating the site and to recommend final boundaries. Ecological values including the distribution of species at risk in the area within Ka'a'gee Tu are not well known which represents a major gap in knowledge of the area's value for species at risk conservation.

OBJECTIVES:

- To conduct nest searches within the Ka'a'gee Tu candidate protected area;
- To determine the presence and distribution of three target species, rusty blackbird, Canada warbler and olive-sided flycatcher, as well as other threatened species;
- To locate nests or determine evidence of breeding (e.g., fledglings) to build credible breeding evidence for these species;
- To determine several habitat variables of nest sites; and
- To add to baseline data for the candidate protected area to be used for long-term monitoring programs.

METHODS:

Playback surveys were conducted at sites selected from avian point count surveys performed in 2009 and 2010 within the Ka'a'gee Tu candidate area boundary. Calls of three species at risk (rusty blackbird, Canada warbler and olive-sided flycatcher) were used to elicit responses from these species at playback stations. Nest searches for these species were conducted when an individual was detected (i.e., seen or heard). Nest site locations, basic habitat and site characteristics were recorded at each nest. To minimize disturbance to nesting individuals or pairs, searches were limited to two hours per nesting pair.

Incidental observations of birds and mammals were recorded to augment our knowledge of the distribution of wildlife in the area.

RESULTS AND MAIN CONCLUSIONS:

In 2011, 28 sites encompassing 125 playback stations were surveyed within the Ka'a'gee Tu boundary with a total of 951 birds representing 81 species detected. A total of 53 species at risk individuals were detected during the study including ten olive-sided flycatchers, five Canada warblers, four horned grebes, one short-eared owl and 33 rusty blackbirds. Three juveniles (fledglings) and five nests of rusty blackbirds were also found in the area. Although we did not find any Canada warbler or olive-sided flycatcher nests due to their breeding behaviors (i.e., secretive nesting, large territory size), we found significant evidence that these species are breeding in Ka'a'gee Tu (e.g., exhibiting territory defence). The three most abundant bird species observed from incidental observations were chipping sparrow, palm warbler and black tern. Observations of other rare species include eight sora, two marsh wrens and one pied-billed grebe.

LONG-TERM PLANS AND RECOMMENDATIONS:

The 2011 surveys indicated high use of Ka'a'gee Tu by species at risk and permanent protection of the area would benefit the long-term conservation of these species. Results from this and other recent bird surveys in the area are important in determining final recommended boundaries and in developing a draft management plan for Ka'a'gee Tu. Songbird and nest surveys from 2009, 2010 and 2011 will also form the basis of an avian monitoring program that will be implemented once the area is established as a National Wildlife Area.

We do not anticipate performing any ecological surveys for the area in 2012. An ecological assessment that includes the information collected in the 2011 field season is currently being drafted and will be complete by October, 2011.

COMMUNITY INVOLVEMENT:

There has been extensive community consultation associated with the process to establish Ka'a'gee Tu as a National Wildlife Area. Several community members including the Chief, elders, counselors and other community members participate on the Ka'a'gee Tu working group. All working group meetings have been held in the community of Kakisa and are open to the public.

Jeremy Simba from Kakisa was hired to assist with songbird nest searches in 2011.

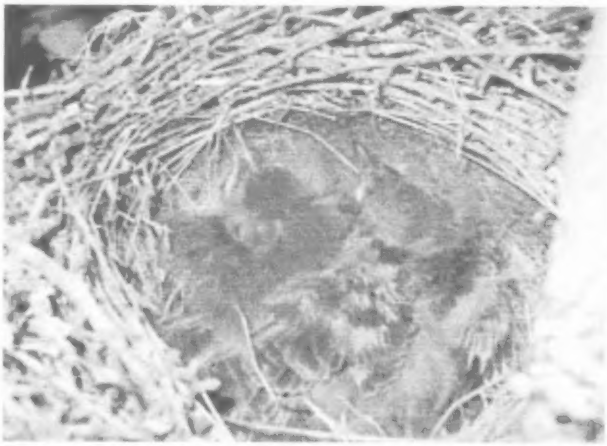

Photo: K. Kardynal

Rusty blackbird nest

Ecological Regions (ecosystem classification) of the Northwest Territories Arctic Islands

JULY 2011

MAIN INVESTIGATOR:

Robert Decker, Wildlife Biologist
Habitat Conservation,
Environment and Natural Resources, GNWT

WILDLIFE RESEARCH PERMIT NUMBER:

WL005404

LOCATION:

Northwest Territories Arctic Islands.

PARTNERS:

- Funding for this work has been provided by ENR and Environment Canada.

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RATIONALE:

All provinces and territories have some form of hierarchical ecological land classification (ELC) that integrates climate, physiography, and biotic factors in some fashion. These classifications can be a useful tool/framework for ecosystem-based resource management and land use planning as well as for understanding the effects of climate change, cumulative effects and natural disturbance on the landscape.

The only NWT-wide ELC, the National Ecological Framework for Canada (1996), has been a poor fit for managing biological systems – largely due to its physiographic bias and the fact that climate was only an attribute and not an integral component of the classification.

The Department of Environment and Natural Resources (ENR) recognized the need for a more relevant landscape-level ecological classification framework, along with revised mapping of the ecological regions of the NWT. In 2004, ENR (jointly Wildlife and Forest Management divisions) began a program to meet this need. Reports and ecological mapping have been completed for the mainland forested (Taiga Plains, Taiga Shield) and mountain (Cordillera) areas. A new ELC for tundra areas of the mainland (Southern Arctic) should be completed later this year. The success of the program carried out on the mainland to date led to a commitment by ENR (Wildlife) to see a consistent and seamless new ELC completed for the entire NWT.

OBJECTIVES:

- To complete the ELC coverage for the remainder of the NWT – Arctic Islands.

METHODS:

The ELC work involves integrating existing information on geology, landforms, climate and vegetation, as well as new data collected through intensive field programs to revise, describe and map at various broad scales (from National/ Territorial to Regional), the ecological regions of the NWT.

The additional data as well as the intensive photo record collected during the field programs is critical to this process. The current three-person field crew members (ENR project lead, ecologist contractor, Arctic soils specialist) have been involved with the ELC program from its inception and responsible for all of the interpretation and ecological mapping being undertaken through completion of the Arctic islands ELC work.

RESULTS AND MAIN CONCLUSIONS:

An AS350 B2 helicopter, outfitted with pop-out floats and sliding camera windows, was used to carry out the aerial surveys and ground assessments over a three week period in July 2011. Approximately 10,000 high resolution oblique landscape and ground plot photos were taken. The area surveyed covered all of the NWT Arctic islands. Surveys for the northern Arctic islands were flown from a field camp at Mould Bay (Prince Patrick Island). Surveys of Banks and Victoria Islands, mostly ground-truthing assessments as a follow-up to the fixed-wing aerial surveys carried out in July 2010, were flown from the communities of Ulukhaktok and Sachs Harbour.

Preliminary ecological mapping for Banks and Victoria islands occurred in 2011.

LONG-TERM PLANS AND RECOMMENDATIONS:

Subject to funding availability, mapping of the ecological areas of the NWT Arctic islands is scheduled to be completed in 2011/12. A final report and poster(s), that would also be available to download from ENR's website, would be scheduled to be completed in 2013.

Photo: D. Downing

Victoria Island, NWT.

Darnley Bay Resources Ltd. 2010-2013 Field Program: Pre-Activity Nest Surveys

JUNE 2010 TO JUNE 2011

MAIN INVESTIGATOR:
Stephen Reford, Darnley Bay Resources

WILDLIFE RESEARCH PERMIT NUMBER:
WL007419

LOCATION:
Near Paulatuk, NWT.

CONTACT:
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RATIONALE:

As Darnley Bay Resources Ltd.'s (DBR's) field program area provides nesting, brood-rearing, moulting and staging habitat for a variety of avian species, pre-activity nest surveys will be conducted at all proposed drill sites and camp sites that will be utilized during the migratory bird nesting season (May 15 - July 15).

OBJECTIVES:

- To identify if birds are nesting in or near identified drill and camp sites; and
- To identify which bird species are nesting in or near identified drill and camp sites.

METHODS:

Camp sites and drill targets that will be utilized during the migratory bird nesting period will be visited no more than five to seven days prior to activity beginning at that site, for the purpose of conducting a pre-activity nest survey at that site.

The pre-activity nest surveys will be conducted by walking transects across the proposed activity location, plus a surrounding buffer of 25 m. The perimeter of the buffer area will be staked to delineate the survey area; stakes will be removed at the end of the camp or drilling activity.

If no active nests are identified during the pre-activity nest survey, the site can be cleared for drilling or camp site set-up. If active nests are present during the survey, the activity planned for that site will have to wait until the nest(s) become inactive. For sites with active nests, it may be possible that a secondary activity site nearby and outside of the established buffer can be identified and searched for nests.

RESULTS AND MAIN CONCLUSIONS:

No results and main conclusions submitted.

LONG-TERM PLANS AND RECOMMENDATIONS:

No long-term plans and recommendations submitted.

Photo: L. Pirie

Sandpiper on the tundra.

Monitoring Wildlife along Enbridge Right of Way

OCTOBER 1, 2010 TO MARCH 31, 2011; ACTIVITY PERIOD: NOVEMBER 13, 2010 - MARCH 31, 2011

MAIN INVESTIGATOR:

Ann-Marie Tout, Manager,
Enbridge Pipelines (NW) Inc.

WILDLIFE RESEARCH PERMIT NUMBER:

WL005760

LOCATION:

Enbridge Right of Way (Kp 66 - Kp 123)
from November 13, 2010 to March 5, 2011

Enbridge Right of Way (Kp 660 - Kp 696)
from December 9, 2010 to March 27, 2011

Enbridge Right of Way (Kp 280 - Kp 354)
from December 11, 2010 to March 31, 2011

PARTNERS:

- Tulita Renewable Resources Council
- Pehdzeh Ki First Nation
- Sambaa K'e Dene Band

CONTACTS:

Ann Marie Tout, Manager
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RATIONALE:

The project was re-instated at the request of the communities involved.

OBJECTIVES:

To support and encourage community-based programs to document wildlife sightings and wildlife tracks along the Enbridge Right of Way.

METHODS:

Wildlife monitors traveled various sections of the Right of Way by snowmobile and documented their observations of wildlife tracks.

RESULTS AND MAIN CONCLUSIONS:

Reports are available from participating communities. No other reports will be produced.

LONG-TERM PLANS AND RECOMMENDATIONS:

Pending approval of a permit application for 2011/2012, the program will continue to provide communities with the opportunity to document wildlife sightings and tracks along the Enbridge Right of Way.

COMMUNITY INVOLVEMENT:

The value of the proposed 2011/2012 programs has been increased at the request of participants

Photo: A.Gunn

Wolf near Norman Wells, NWT.

Wildlife Effects Monitoring Program

MAY 15, 2011 TO MAY 15, 2012

MAIN INVESTIGATOR:

Claudine Lee,
Superintendent Environmental Operations,
BHP Billiton

WILDLIFE RESEARCH PERMIT NUMBER:

WL005693

LOCATION:

Located on the EKATI property, approximately 300 km northeast of Yellowknife, focussing on the 1600 km^2 monitoring study area surrounding the mine (64° 40′ N, 110° 43′ W).

CONTACT:

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RATIONALE:

The requirement for wildlife effects monitoring at the BHP Billiton Canada Inc. EKATI Diamond Mine is described in the Environmental Agreement between Canada (DIAND), the Government of the Northwest Territories, Environment and Natural Resources (ENR) and BHP Billiton (January 1997). Wildlife effects monitoring has taken place every year since 1997.

The tasks of the program summarized in this document are the results of a long-term continuing consultation and planning process involving numerous stakeholders. The aim of consultation is to identify wildlife monitoring priorities and cause no negative impact on wildlife.

OBJECTIVES:

To test impact predictions and efficacy of mitigation measures for the following species.

- Caribou: to monitor the potential effects of the following mine activities: potential collisions with vehicles, incidents involving aircraft, general disturbance from the mine, roads as potential barriers, incidents at pits and the Long Lake Containment Facility.
- Grizzly bears: to monitor the potential effects of the following mine activities: potential collisions with vehicles, disturbance possibly affecting bear activity level, and the mine possibly attracting bears.
- Wolves: to monitor the potential effects of the following mine activities: potential collisions with vehicles, disturbance possibly affecting den use and the mine possibly attracting wolves.
- Wolverine: to monitor the potential effects of the following mine activities: potential collisions with vehicles, disturbance possibly affecting their presence near the mine and the mine possibly attracting wolverine.

- Upland breeding birds: to obtain a species count by conducting the North American Breeding Bird Survey (NABBS) and maintaining incidental records of upland breeding birds, shorebirds and waterfowl.
- Falcons: to monitor the potential effects of the following mine activities: disturbance possibly affecting occupancy and productivity.

METHODS:

Methods proposed for the 2011 WEMP are as follows:

Caribou: BHP will continue to record caribou observations and incidents, conduct behaviour observations on caribou groups within the BHP claim block, perform snow track surveys along the Misery and Sable roads using snowmobiles and light vehicles and conduct vehicle-based surveys and behavioural scans along the Misery, Fox and Ekati haul roads and also the Long Lake Containment Facility (LLCF).

Behavioural focal and scan surveys: Currently occur up to several times per week during the field season (approximately late April to end-October) when caribou are present within the study area. Two observers record caribou activity, GPS location, group composition, number of animals, and level of insect harassment. Observers wait four minutes before conducting and recording the first scan. This is repeated every four minutes for a maximum of eight scans (assuming no stressor for each group). If a stressor is introduced during scan sampling, the observers note the time and record the response of caribou to the stressor(s). The reaction of the majority of the group is recorded. Insect harassment is recorded after watching one focal animal for two minutes during the scan.

The behavioural scan survey methodology described above will be maintained in 2011 with continued collaboration between Diavik and BHP to improve data collection further from mine infrastructure. This recognises that due to the close geographic proximity to each other, the mines' footprints overlap to some extent.

BHP will continue to conduct behavioural scan surveys of caribou herds <2 km from mine infrastructure when animals are reported by field staff. Road surveys along the Misery, Fox, and Ekati haul roads and Long Lake Containment Facility (LLCF) will occur weekly. These surveys, coupled with regular Misery Camp inspections, ensure frequent opportunities to locate caribou groups. ENR collared animals will be used as an aid to identify times when caribou are likely to be present at the Ekati mine site.

As a new initiative in 2011, and consistent with BHP's effort to expand the focus on behaviour data, additional caribou behavioral surveys are planned to be conducted opportunistically by BHP wildlife technicians if caribou are observed further than 2 km from infrastructure (up to the boundary of the BHP claim area) and a helicopter is available on-site (for example, during the pilot grizzly bear hair snagging study sessions).

Remote Camera Surveys: Motion sensor cameras will be strategically placed along Misery Road, Sable Road, fencing structures where applicable (airport, Pigeon Pit), and possibly along well known movement paths on the tundra (in the vicinity of the mine). When available, cameras could be in operation 24 hours a day between April 1 and November 30, and mounted on a support post.

Behavioral Focal Surveys: This is an expanded and more vigorous program from that of 2010. In addition to scan sampling, BHP will conduct focal behavioral surveys. One male and one female will be separately observed from each group of ten animals. Juveniles will be observed opportunistically. Animals will be observed for a minimum of 30 minutes. If a stressor event occurs during the observation, the time and type of stressor (e.g., helicopter, light vehicle, blast, etc.) is recorded and the animal is observed an additional 15 minutes following the stressor. Focal samples will be conducted in conjunction with scan samples at varying distances from the mine.

As a new initiative in 2011, BHP is planning to research and test video surveillance use with helicopters. This may involve aerial tests of cameras as a potential survey mechanism.

Grizzly bears: BHP will continue to record grizzly bear observations and incidents, conduct landfill and waste bin monitoring, and participate in the active deterrence of grizzly bears from personnel and camp infrastructure.

ENR is awaiting new information from similar studies elsewhere to apply to their regional planning for a broader grizzly bear population assessment in the future. In the meantime, BHP expects to continue to conduct its DNA hair snagging pilot studies that were started in 2010 into the 2011 WEMP period. The study is conducted using barbed-wire tripods distributed among high quality grizzly bear habitats in around 8-12, 10 km x 10 km cells. A variety of non-reward, commercially available, scented lures will be used to draw bears to the posts. Posts will not be placed within 5 km of camp infrastructure. Four sampling sessions are planned, and hair snagging tripods may be moved to new locations between each session. The survey methodologies learned from the pilot phase may assist ENR in regional planning for a broader grizzly bear population assessment.

Wolves: BHP staff will continue to record all wolf observations and incidents, and incidental observations during helicopter flights, and conduct landfill and waste bin monitoring. BHP will continue to share information with ENR biologists and to assist ENR with aerial surveys for den occupancy and pup productivity surveys if needed.

Wolverines: In 2011, the recording of all observations and incidents, fencing and skirting surveys, as well as landfill and waste bin monitoring will continue. During March 2010 BHP, in conjunction with Diavik, participated in the ENR-led wolverine DNA study (as was conducted in 2005-2006). Under the guidance of ENR carnivore biologist Robert Mulders, BHP will continue to participate in the 2011 program. The wildlife research permit for this study is held by ENR.

Upland breeding birds: As in 2010, BHP will continue to participate with the North American Breeding Bird Survey (NABBS), and record incidental observations of upland breeding birds, shorebirds, and waterfowl. This survey occurs one day per year, usually mid-June.

Falcons: BHP will continue to record all observations and incidents, and conduct pit wall surveys for nesting raptors.

A regional falcon occupancy and productivity survey will continue to be conducted co-operatively by ENR and Diavik personnel, and includes the BHP claim block. Known falcon territories are monitored twice during the breeding season. Historic nesting sites are first surveyed in early June to determine nest occupancy. Each occupied nest is again monitored in mid-July to determine the number of chicks produced. Truck-accessible nesting sites will be monitored more frequently, while helicopter accessed sites will only be monitored twice (early June and mid-July). ENR's raptor biologist Steve Matthews conducts occupancy and productivity surveys at the Daring Lake Study Area to use as a reference site for comparison.

Noise Monitoring: A new initiative to 2011 and in response to community concerns presented at the October 5th and

6th 2010 Community Workshop over the impacts that noise may have on wildlife, BHP plans to measure decibel levels at varying distances from the mine.

RESULTS AND MAIN CONCLUSIONS:

A summary of the 2011 WEMP is provided in brief as follows:

Caribou: Caribou monitoring was addressed by focusing upon five areas: incidental observations; behaviour; distribution relative to roads; road permeability; and use of the LLCF.

EKATI personnel reported 191 incidental observations in 2011, the most since 2007 (193).

Aerial surveys were not flown in 2011. Timing of the northern migration through the EKATI study area has shown little variation from 1997 to 2006, with most peaks occurring around May. The majority (13,011 or 88%) of all 14,766 caribou were seen during the fall (October 4 to 12, 2010). Only 628 caribou were observed passing through site during the fall of 2011, demonstrating the highly variable presence of caribou during their annual migration. Over 500 caribou were also observed near site during post-calving in 2011, lower than the 1,700 observed near site during post-calving in 2010.

During 2011, focal behaviour observations were conducted on 46 individual caribou, with 27 observed for more than 20 minutes (2 cows with calves, 12 lone cows, 11 bulls, and 2 juveniles). Overall, caribou spent most of their time feeding (males 46%; females 53%), walking (males 23%; females 18%) or bedded down (males 16%; females 15%). There was no significant difference between males and females.

Small particle processed kimberlite (sand sized and smaller) is deposited in the LLCF. Concern has been expressed that caribou may either become trapped in the processed kimberlite, or ingest it. The LLCF was surveyed on 65 occasions between October 1, 2010 and December 31, 2011. The survey has been conducted since 1999, and no caribou have been observed getting stuck in the kimberlite and currently there is very little vegetation in the basins. In 2011, caribou were seen in the vicinity of the LLCF on five occasions, all were individuals, and tracks were observed once. Another five individuals and a group of 16 were also incidentally recorded in the vicinity of the LLCF. Caribou have been surveyed and noted resting on the frozen LLCF cells during their northern migration.

Grizzly bears: Recording grizzly bear occurrence relative to mining infrastructure is an objective of the WEMP addressed by recording incidental sightings. In the 2011 WEMP, 70 incidental sightings of grizzly bears were recorded, for a total of 117 total bears. A total of 33 family groups were observed, the most since record collection started in 2001. Deterrent actions were required on five occasions to move grizzly bears away from camp and/or personnel, compared to 18 deterrent actions required in 2010. A helicopter was used in all these occasions. Neither bears nor personnel were injured during these incidents.

A preliminary DNA hair snagging study was continued in 2011 between June and August. Barbed-wire posts were distributed in 13, 10 x 10 km cells surrounding the EKATI mine site. Site selection focused on high quality grizzly bear habitat. Five hair collection sessions were conducted, and the posts were moved between sessions. A different lure was introduced during each session. A total of 218 hair samples were collected in 2011, in addition to the 39 that were collected in 2010. All 257 samples from both years were submitted for DNA analyses. Overall, 15 individuals were identified, nine males and six females.

Wolves: Mine personnel recorded incidental sightings of wolves near mine infrastructure and ENR conducted regional den occupancy and productivity surveys. There were 41 incidental sightings of wolves. There were two incidents involving wolves near personnel in 2011, one deterred by a bear banger and the other by helicopter. Fourteen of the incidental sightings recorded multiple wolves; the largest a group of 13. Den surveys conducted by ENR found four active dens within the EKATI claim block, and none were productive.

Wolverines: Mine personnel recorded incidental observations of wolverine near mine infrastructure in 2011. There were 12 observations recorded on 11 separate days. Eleven of the sightings were of solitary individuals, and the other sighting was of a pair of wolverines walking near Misery Road. None of the observations were close enough to work crews and/or the camp to require use of deterrents.

BHP Billiton participated in the 2011 wolverine DNA program conducted by ENR under a wildlife research permit held by Robert Mulders. Final results are pending. The EKATI study area contains 184 barbed-wire posts, but due to poor snow conditions only 111 were sampled. 498 samples were submitted for DNA analysis, yielding 98 good samples that could be used for DNA extraction. In the 2011 study, 13 males and 12 females were identified, including 13 recaptures from previous work in the study area, 9 that matched animals sampled in the DDMI study area, 7 recaptures from Daring Lake. Altogether, 63 individuals (35M: 28F) have been identified in the EKATI study area over four years of sample collection.

Foxes: Mine personnel recorded incidental observations of Arctic and red foxes near mine infrastructure in 2011. There were 61 incidental sightings of 66 individual red foxes over 55 separate days. Only two Arctic fox have been sighted since 2009. There were two incidents involving red foxes involving access to a waste bin and into a building, but deterrents were not required.

Upland breeding birds: The North American Breeding Bird Survey (NABBS) was conducted at EKATI on June 15, 2011. Thirty species were identified with 371 individuals observed, compared to 23 species and 237 individuals observed in 2010. This is the first year that snowy owl and northern harrier have been observed during the survey, and the first year since 2006 that semi-palmated plover and stilt sandpiper have been recorded. Black scoter, ranked as sensitive in the NWT General Status Ranking Program, was observed in 2010 and again in 2011.

Falcons: Pit walls and other infrastructure have the potential to provide nesting habitat for cliff-nesting birds. Surveys of all open pits at EKATI, as well as Fox Fuel Farm and Long Lake Road power station, were conducted from early April to late August, 2011 to identify nesting activity. Raptors nested and successfully fledged from Beartooth Pit (rough-legged hawks; four fledglings) and Misery Pit (peregrine falcon with three fledglings; common raven with three fledglings). A common raven nest was also observed on the new incinerator building and produced three fledglings.

LONG-TERM PLANS AND RECOMMENDATIONS:

Mitigation strategies continue to be implemented and improved upon at EKATI. These are in place to promote the natural state of wildlife behaviour on and adjacent to the mine site, and to maximise safety for wildlife and personnel. A list of work planned for 2012 is as follows:

Caribou: EKATI Environment staff will continue to record caribou observations and incidents, conduct behaviour observations on caribou groups within the EKATI claim block, and conduct behavioural scans along the Misery and Fox haul roads, and also the Long Lake Containment Facility (LLCF).

Behavioural focal and scan surveys: Currently occur up to several times per week during the field season (approximately late April to end-October) when caribou are present within the study area. Two observers record caribou activity, GPS location, group composition, number of animals, and level of insect harassment.

During a scan survey, observers wait four minutes before conducting and recording the first scan. This is repeated every four minutes for a maximum of eight scans (assuming no stressor for each group). If a stressor is introduced during scan sampling, the observers note the time and record the response of caribou to the stressor(s). The reaction of the majority of the group is recorded. Insect harassment is recorded after watching one focal animal for two minutes during the scan.

During a focal survey, observers record behaviours of a single individual during a 30-60 minute observation period. The priority is to observe females with calves, lone females, and bulls. Time permitting, juveniles will also be observed. One observer will call out changes in behavior (e.g., feeding, walking, bedding, alert, or running), and a recorder will note the behavior along with a time stamp so the total duration of each behavior can be calculated. If a stressor event occurs during the observation, the time and type of stressor (e.g., helicopter, light vehicle, blast, etc.) is recorded, along with the animal's response to the stressor. Focal samples will be conducted in conjunction with scan samples at varying distances from the mine.

The scan survey provides a frequency distribution of general behaviours over time, whereas the focal method provides detailed activity budgets of individuals as they pass through site. The behavioural survey methodologies described above will be maintained in 2012, with continued collaboration between Diavik Diamond Mine Inc. (DDMI) and EKATI to improve data collection further from mine infrastructure. This recognises that due to the close geographic proximity to each other, the mines' footprints overlap to some extent.

EKATI Environment staff will continue to conduct behavioural scan surveys of caribou herds <2 km from mine infrastructure when animals are reported by mine personnel. Road surveys along the Misery and Fox haul roads and LLCF will occur weekly. These surveys, coupled with regular Misery Camp inspections, ensure frequent opportunities to locate caribou groups. ENR collared animals will be used as an aid to identify times when caribou are likely to be present at or near the EKATI mine site.

Continued cooperation between EKATI and DDMI will have DDMI focusing its efforts on collecting data further from mine infrastructure and sharing helicopter use with EKATI to survey herds greater than 14 km from the nearest point of either EKATI or DDMI infrastructure. It is understood that data will be jointly shared between DDMI and EKATI.

As a new initiative in 2012, and consistent with efforts to expand the focus on behavior data, additional caribou behavioral surveys are planned to be conducted opportunistically by wildlife technicians if caribou are observed further than 2 km from infrastructure (up to the boundary of the EKATI claim area) and a helicopter is available on-site (for example, during the pilot grizzly bear hair snagging study sessions).

Remote Camera Surveys: This was a new initiative in 2011, and will be expanded in 2012. Fifty remote motion sensor cameras were incorporated into the monitoring program for caribou (and possibly other wildlife). Motion sensor cameras were strategically placed along Misery Road, Sable Road, fencing structures where applicable (airport, Pigeon Pit), and along well known movement paths on the tundra (in the vicinity of the mine). The objectives were to record caribou (and other wildlife) activity and to monitor their movements and their interactions with mine infrastructure. In 2012, an additional 40 cameras (for a total of 90) will be deployed. The use of cameras (in combination with intensive behavioural studies) is intended to replace aerial and road-side surveys as a mechanism for onsite monitoring of caribou (and other wildlife). When available, cameras could be in operation 24 hours a day between April 1 and November 30, and are mounted on a support post.

Aerial surveys: EKATI will collaborate with Diavik to conduct aerial surveys during the 2012 WEMP period. A review of the combined caribou aerial survey data is pending completion (per the June 28, 2010 Technical Workshop). Further investigation of the need for and design of aerial surveys to meet WEMP Objectives is planned with the stakeholders in 2012.

Grizzly bears: EKATI environment staff will continue to record grizzly bear observations and incidents, conduct landfill and waste bin monitoring, and participate in the active deterrence of grizzly bears from personnel and camp infrastructure. A regional grizzly bear DNA program is planned in collaboration with DDMI.

Wolves: EKATI environment staff will continue to record all wolf observations and incidents, incidental observations during helicopter flights, and conduct landfill and waste bin monitoring. Information regarding wolves will continue to be shared with ENR biologists and assistance will be provided to ENR with aerial surveys for den occupancy and pup productivity surveys if needed.

Wolverines: In 2012, the recording of all observations and incidents, fencing and skirting surveys, as well as landfill and waste bin monitoring will continue.

Upland Breeding Birds: As in 2011, EKATI will continue to participate in the North American Breeding Bird Survey (NABBS), and record incidental observations of upland breeding birds, shorebirds, and waterfowl. This survey occurs one day per year, usually mid-June.

Falcons: EKATI personnel will continue to record all observations and incidents, and conduct pit wall surveys for nesting raptors.

COMMUNITY INVOLVEMENT:

The Environmental Advisor-Traditional Knowledge position is responsible for disseminating information to and from the communities, and for inviting participation by community members in the various programs occurring at EKATI. The intent for 2012 is to involve both youth and elders from the various communities to participate in caribou behavioural surveys (primary goal), to work with the setup and maintenance of a regional grizzly bear DNA program (research permit under separate review), and to work with other on-going programs. It is anticipated that community members will be involved in the field programs on a bi-weekly basis between May and November, 2012.

EKATI continues to employ four wildlife technicians, an environmental advisor dedicated to wildlife, and a consultant wildlife biologist (to guide, manage and implement the 2012 WEMP programs). Currently three of the technicians are aboriginal and all live locally in the NWT. In addition, the EKATI Environment Department will continue to provide aboriginal post-secondary students with the opportunity to work during the summer field season.

Photo: D. Brosha

Photo: D. Brosha

Photo: D. Brosha

Geese, foxes, and wolves are just a few of the species being monitored at BHP Billiton EKATI.

Wildlife Monitoring Program for the Diavik Diamond Mine

JUNE 2010 TO JUNE 2011

MAIN INVESTIGATOR:

David Wells, Superintendent Environment
and Sustainable Development,
Diavik Diamond Mines Inc.

WILDLIFE RESEARCH PERMIT NUMBER:

WL005696

LOCATION:

The Diavik wildlife study area,
centered around Lac de Gras, NWT.

CONTACT:

David Wells, Superintendent, Environment
Diavik Diamond Mines Inc.
PO Box 2498
Yellowknife, NT X1A 2P8
(P) 867-669-6500 ext. 5536
(F) 867-669-9058

RATIONALE:

To monitor wildlife within the vicinity of the mine.

OBJECTIVES:

- To verify the occupancy of the predicted effects determined in the Environment Effects Report (Wildlife 1998) and the Comprehensive Study Report (June 1998); and
- To ensure that management and mitigation measures for wildlife and wildlife habitat are effective in preventing significant adverse impacts to wildlife.

METHODS:

The object is to collect appropriate information that will assist Diavik in verifying predicted effects and to determine the effectiveness of mitigation measures.

Barren-ground caribou: scanning observations, GPS locations, ground based observation surveys, and road observations.

Grizzly bear: based on diet selection and seasonally preferred habitats, the presence of bear sign within and adjacent to seasonal high quality habitat (sedge wetland in June and riparian shrub in August) was used as an index of habitat utilization by grizzly bears within the Diavik study area.

Wolverine: snow track surveys, DNA research, regular inspections of food and waste compliance, incidental observations, and wolverine mortalities associated with mining activity are reported and documented.

Waterfowl and other aquatic birds: ground based surveys.

Raptors: surveys and monitoring conducted for infrastructure nesting, incidental observations documented.

RESULTS AND MAIN CONCLUSIONS:

Successful implementation of ground based surveys were conducted. Mine footprint extent and habitat loss remained within the projections of the Environmental Assessment. No project related mortalities during 2010. There was a short-eared owl mortality that occurred on 31 August 2010; the carcass was found near Surface Operations ready line and cause of death unknown.

A total of 47 hair samples were collected from the grizzly bear DNA pilot study, 26 from riparian habitat and 21 from sedge wetland plots. All samples were archived.

A total of 93 samples were analyzed for individual identification for the wolverine DNA sampling program in 2010. Of these samples, a total of 19 individuals (8 males and 11 females) were identified within the Diavik study area during the 2010 program.

In regards to the raptor program, eight known sites in the Diavik wildlife area were surveyed during the spring occupancy survey. Six of the eight nest sites surveyed were occupied by peregrine falcons and three of the nests contained a breeding pair of peregrines, while the other three contained a single peregrine falcon. During the productivity survey in July 2010, four of the eight nests were occupied by peregrine falcons, and three of the four were confirmed productive. Bird observations totalled 1,331 with 10,407 individuals recorded that included passerines, birds of prey, fowl-like birds and seabirds during the 2010 waterfowl program.

LONG-TERM PLANS AND RECOMMENDATIONS:

Diavik Diamond Mines Inc. (DDMI) has been working collectively with the Government of the Northwest Territories (GNWT), other diamond mining companies and their respective environmental advisory boards to review the existing wildlife programs at the mines and determine areas for improvement. During 2010, working groups focused on the objectives for the caribou aerial and grizzly bear monitoring programs in order to improve consistency and provide a regional benefit. DDMI plans to conduct caribou aerial surveys at a frequency cycle of three years on, two years off in an effort to capture changes to the zone of influence as mine activity levels decrease over time. The frequency of monitoring for raptor surveys will be reduced to every five years in alignment with the federal program. Additionally, DDMI has continued visiting communities to inform them of the results and status of the current programs.

COMMUNITY INVOLVEMENT:

Northern residents will continue to be an integral part of the wildlife monitoring program in the Lac de Gras area by providing assistance, local knowledge, and a northern perspective to the program.

For 2010, the Environment department hired two seasonal Aboriginal Environment Technicians, as in past years. This will assist in incorporating local participation and knowledge from different communities into the various monitoring programs, as well as providing an opportunity for community members to work on the land and better understand mining developments.

Additional community assistants are recruited from communities to assist with various environmental programs.

In 2010, a community input – traditional knowledge workshop was conducted; a site visit to both Diavik and Ekati mine was completed to allow participants in the workshop to see the mine sites and the wildlife monitoring areas and equipment before workshop.

Diavik also initiated a desktop review of Traditional Knowledge / Inuit Qaujimajatuqangit (TK/IQ), in order to find other community organizations or companies that have successfully developed TK/IQ monitoring or closure planning programs.

Courageous Lake Project Baseline Program

MARCH 2011 TO SEPTEMBER 2011

MAIN INVESTIGATOR:

Dr. Gregory Sharam, Lead Terrestrial Services, Rescan Environmental Services

WILDLIFE RESEARCH PERMIT NUMBER:

WL005697

LOCATION:

The Courageous Lake Project is located south of Courageous Lake (64°05', 111°15'), approximately 240 km northeast of Yellowknife, NWT.

CONTACT:

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Rescan Environmental Services
908-5201 50th Avenue
Yellowknife, NT X1A 3S9
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RATIONALE:

Baseline studies were conducted to provide a reference point for future monitoring studies and allow the evaluation of potential effects of the project.

OBJECTIVES:

- To collect data on wildlife habitat features and evaluate selected wildlife populations and landscape use within the project local study area and regional study area.

METHODS:

Baseline studies focused on mammalian and avian communities and involved both aerial and ground surveys.

Aerial surveys were conducted to 1) determine the location of active and inactive raptor nests and carnivore dens and assess the productivity (i.e., success of breeding attempts) at active nests and dens; and 2) determine the species diversity and abundance of water dependent birds during spring and fall staging periods and summer breeding periods. Ground-based surveys were conducted to 1) track wildlife presence through remote digital cameras; 2) collect wolverine hair using baited capture stations for DNA analysis; 3) collect grizzly bear hair using baited capture stations for DNA analysis; 4) record species diversity and abundance of upland breeding birds through area constrained surveys; and 5) record the presence of migrating bird species with areas of proposed infrastructure in the fall.

RESULTS AND MAIN CONCLUSIONS:

Detailed information regarding the results of 2011 baseline studies, including maps, will be made available in the Courageous Lake Project: 2011 Wildlife Baseline Report.

LONG-TERM PLANS AND RECOMMENDATIONS:

Habitat for key wildlife species will be mapped using the vegetation and wildlife habitat classification system developed for the Tibbitt to Contwoyto winter road.

COMMUNITY INVOLVEMENT:

Members of the Yellowknives Dene First Nations participated in the collection of wildlife data during the summer of 2011 in the role of Environmental Field Assistants.

Photo: T. Anaka

Wolf den

Photo: J. Shewan

Songbird nest

Baseline Wildlife Studies: Gahcho Kue Project

JANUARY 1, 2011
TO DECEMBER 31, 2011

MAIN INVESTIGATOR:

Golder Associates Ltd.

WILDLIFE RESEARCH PERMIT NUMBER:

WL005700

LOCATION:

The regional study area (RSA) for wildlife studies is defined by a 70 km by 80 km rectangle centered on Kennady Lake, NWT. The project is approximately 280 km northeast of Yellowknife and 140 km northeast of Łutselk'e.

PARTNERS:

- De Beers Canada Inc.

CONTACT:

Dan Coulton
Golder Associates Ltd
(P) 867-873-6319
(E) daniel_coulton@golder.com

RATIONALE:

Baseline studies were completed to augment existing information on wildlife species and habitat surrounding the project. Data obtained will be used to predict and mitigate effects to wildlife from project development, provide development information in support of a future environmental effects monitoring program, and contribute to regional studies for assessing and managing potential cumulative effects.

OBJECTIVES:

- To further describe the occurrence, relative abundance, distribution, and habitat use of wildlife in the study area;
- To predict effects to the environment and wildlife from project development;
- To provide baseline data for testing environmental effects predictions and the effectiveness of mitigation; and
- To guide further mitigation and adaptive management for reducing unexpected effects.

METHODS:

Caribou surveys were completed on existing transect lines within the RSA on May 11 and November 14, 2011.

Observers recorded caribou numbers, distribution, behaviour, group size and composition, habitat type, and snow track densities. Survey transects were flown by helicopter an altitude of 120 m above the ground and an average speed of 150 km/h.

Wolverine snow track surveys were completed from March 29 to April 2, 2011, and again from April 15 to 19, 2011. Two observers surveyed 51 transects, 4 km in length, each surveyed by snowmobile.

Wolf dens known within the RSA were surveyed by helicopter on June 10, 2011. Each den was hovered over for less than one minute to document any recent signs of activity.

Grizzly and black bear hair snagging stations in the RSA were active from July 19 to September 16, 2011. The stations used a scent lure to attract bears, and were checked regularly for the presence of snagged bear hair.

Water birds were surveyed on June 10, 2011. Observers surveyed the shoreline of Kennady Lake and a similar lake nearby with a helicopter flying approximately 50 m above ground level and 60 km/h.

Raptor nest surveys were completed by helicopter on June 10 to determine occupancy and again on July 5, 2011, to determine success.

RESULTS AND MAIN CONCLUSIONS:

No caribou were observed on May 14 but tracks were present. Caribou and tracks were observed on November 14.

Ten wolverine tracks were detected on eight transects during the first survey, while 11 tracks on 10 transects were detected on the second survey.

All wolf dens surveyed were inactive.

Grizzly bear hair was collected at six stations, while no black bear hair was found. All hair samples collected were archived.

Water birds observed included common merganser, red-breasted merganser, yellow-billed loon, common loon, herring gull, and white-winged scoter.

Eleven of 21 (52%) available raptor nests were occupied and eight (73%) of these hatched at least one chick. Nesting species included rough-legged hawk, peregrine falcon, and gyrfalcon.

Detailed methods and results will be available in the 2011 Wildlife Baseline Studies Summary Report for the Gahcho Kue project.

LONG-TERM PLANS AND RECOMMENDATIONS:

Wildlife baseline studies and reporting will continue as permitting process for the project proceeds.

COMMUNITY INVOLVEMENT:

De Beers has been involved in community engagement activities for the project for many years; this is an on-going process. Updates on wildlife studies will be provided to the surrounding communities and will be maintained as the project moves forward. Any questions can be forwarded to Cathie Bolstad of De Beers Canada Inc., at 867-766-7300.

Meetings to discuss project-related activities will be held with the surrounding communities in 2012 subject to their availability. Results of the baseline field studies will be communicated through reports and community presentations.

Every study team involved in the proposed wildlife studies will include a local assistant. Local assistants are selected based on their knowledge of the study area, ability to work as a field technician and/or interest in learning to carry out wildlife surveys. These individuals will assist in the wildlife studies as well as identifying sensitive wildlife, and cultural or traditional use areas. Where experienced individuals are not available, Golder and Associates Ltd. will provide the necessary instruction and technical support for inexperienced local individuals.

Pete Enzo of Łutselk'e participated in wildlife surveys in 2011.

Baseline Wildlife Studies for the Fortune Minerals NICO Project

JANUARY 1, 2011
TO DECEMBER 31, 2011

MAIN INVESTIGATOR:

Golder Associates Ltd.

WILDLIFE RESEARCH PERMIT NUMBER:

WL006877

LOCATION:

The regional study area (RSA) for wildlife studies is defined by a radius of 15 km from the NICO project camp on Lou Lake, NWT and a 5 km buffer on either side of the proposed all-weather access road. The project is approximately 50 km northeast of Whatì and 22 km west of the Snare Hydro Plant.

PARTNERS:

- Golder Associates Ltd.
- Fortune Minerals Ltd.

CONTACTS:

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(E) daniel_coulton@golder.com

Rick Schryer
Fortune Minerals Ltd.
(P) 306-477-2114
(E) rschryer@fortuneminerals.com

RATIONALE:

Baseline studies were completed to augment existing information on wildlife species and habitat surrounding the project and the all-weather access road. Data obtained will be used to predict and mitigate effects to wildlife from project development, provide pre-development information in support of a future environmental effects monitoring program, and contribute to regional studies for assessing and managing potential cumulative effects.

OBJECTIVES:

- To further describe the occurrence, relative abundance, distribution, and habitat use of wildlife in the study area;
- To predict effects to the environment and wildlife from project development;
- To provide baseline data for testing environmental effects predictions and the effectiveness of mitigation; and
- To guide further mitigation and adaptive management for reducing unexpected effects.

METHODS:

Two aerial surveys were completed on existing transect lines within the RSA in 2011. The surveys took place on April 19 and December 14, 2011.

RESULTS AND MAIN CONCLUSIONS:

Observers recorded moose and caribou numbers, distribution, behaviour, group size and composition, habitat type and snow track densities. The surveys were completed with a Found Bush Hawk fixed-wing aircraft at an altitude of approximately 120 m above ground level. Flight speeds averaged 150 km/h.

Snow tracks were observed during the April survey; however, there were no sightings of moose or caribou. During the December survey, 21 caribou and 8 moose were observed and snow tracks were observed throughout the RSA, including within the proposed mine footprint.

LONG-TERM PLANS AND RECOMMENDATIONS:

Wildlife baseline studies and reporting will continue as the permitting process for the project proceeds.

COMMUNITY INVOLVEMENT:

Fortune Minerals has an ongoing community consultation program for the project and will continue this dialog as the project progresses. Consultation started in January 1996 prior to the issuance of Fortune Minerals first land use permit and continues to date. Consultation has included regular community visits and written correspondence to keep communities informed of the company's progress, and providing communities with copies of correspondence between Fortune Minerals and other government departments. A detailed timeline and description of all consultations are available on request.

Fortune Minerals will continue to keep all local communities and any other interested parties apprised of the latest developments regarding the project. Results of the baseline field studies will be communicated through reports and community presentations.

Fortune Minerals will continue to consult local communities regarding activities at the project. Communities will have opportunity to provide input into the wildlife study plans. Local knowledge collected from community assistants will be recorded.

Participants from local communities will be asked to assist with the wildlife surveys. Fortune Minerals will continue to consult local communities regarding activities at the project.

Wayne Langenhan of the North Slave Métis Alliance assisted with the December 14, 2011 survey.

Wildlife Effects Monitoring Program (WEMP) Snap Lake Study Area

JANUARY 2011 TO DECEMBER 2011

MAIN INVESTIGATOR:

Alex Hood, Permitting and Environmental Superintendent, Snap Lake Mine

WILDLIFE RESEARCH PERMIT NUMBER:

WL006881

LOCATION:

All wildlife studies took place within a study area of 31 km radius around the Snap Lake Mine, a total area of 3,019 km^2. These studies occurred at various times from January 1, 2011 to December 31, 2011.

PARTNERS:

- De Beers Canada Inc.
- Golder Associates Ltd.
- Snap Lake Environmental Monitoring Agency

CONTACTS:

Dan Coulton
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(P) 867-873-6319
(E) dcoulton@golder.com

Alexandra Hood, Permitting and Environmental Superintendent
Snap Lake Mine-De Beers
(P) 867-767-8626
(E) Alexandra.Hood@debeerscanada.com

RATIONALE:

The wildlife effects monitoring program (WEMP) is a requirement of the project's environmental agreement (Article VII, 7.2c) and land use permit (condition 36).

The annual Snap Lake WEMP was designed to detect, measure, and manage mine-related impacts to wildlife habitat, wildlife presence, behaviour and distribution, and wildlife injuries and mortalities. The WEMP is intended to provide information for the mine's environmental management system (EMS) to adaptively manage the mine to protect wildlife and wildlife habitat, and to contribute to regional monitoring information that may then be used to assess cumulative effects of mining on wildlife.

OBJECTIVES:

To determine if the mine influences:

- the density, distribution, group composition and behaviour of caribou;
- the relative activity (presence) and distribution of grizzly and black bears; and
- the relative activity (presence) and distribution of wolverines.
- Though not part of the WEMP, wolf den activity was monitored to provide regional information to the Department of Environment and Natural Resources (ENR).

RESULTS AND MAIN CONCLUSIONS:

Results of 2011 wildlife programs will be presented in the Snap Lake wildlife effects monitoring program report. There continue to be interactions with wildlife on site.

LONG-TERM PLANS AND RECOMMENDATIONS:

Wildlife monitoring will continue during the entire operational period of the Snap Lake Mine, as per the Snap Lake mine WEMP.

COMMUNITY INVOLVEMENT:

Community feedback on the WEMP has been provided through the Snap Lake Environmental Monitoring Agency (SLEMA). Pete Enzoe of Łutselk'e participated the grizzly bear program.

Photo: D. Coulton

Wolverine tracks.

Photo: A. Hood

Caribou near Snap Lake Mine.

Chemicals Management Plan Wildlife National Monitoring Program

SUMMER 2011

MAIN INVESTIGATOR:

Cindy Wood, Wildlife Biologist
Western Arctic Waterfowl Program,
Canadian Wildlife Service

WILDLIFE RESEARCH PERMIT NUMBER:

WL006887

LOCATION:

As part of a Canada-wide monitoring program for contaminants, herring gull eggs will be collected from nests along the north shores of the North Arm of Great Slave Lake from Baker Island west to Frank Channel.

CONTACT:

Myra Robertson, Waterfowl Population Biologist
Canadian Wildlife Service
(P) 867-669-4763

Cindy Wood, Wildlife Biologist
Canadian Wildlife Service
(P) 867-669-4786

RATIONALE:

Environment Canada's Chemicals Management Plan (CMP) has funded a national monitoring program to track the occurrence of chemicals in the environment, including wildlife. As part of this program, herring gull eggs will be collected across Canada. Samples from the North Arm of Great Slave Lake will provide information for comparison to populated, industrial regions of Canada as well as to less remote coastal regions. Eggs will undergo toxicology analysis for flame retardants and other chemicals of concern. Monitoring of chemicals is expected to continue for several years in order to assess changes in chemical occurrence over time.

Herring gulls and other gull species have been used to monitor contaminants in aquatic environments for over 30 years. They are used because they are known to accumulate organic contaminants, nest in colonies making egg collection relatively simple, and lay three eggs but seldom rear more than two chicks, thus the removal of a single egg from a nest does not typically reduce breeding success.

OBJECTIVES:

- To assess the toxicological characteristics of local waterbirds in relation to national data.

METHODS:

Gull nesting colonies will be visited by boat to collect herring gull eggs over a period of one to three days during June 10–July 1. Egg collections at the gull colonies are completed in a short amount of time with minimal disturbance and researchers leave the colony quickly. Only one egg from each nest will be collected to a maximum total of 15 eggs. Eggs are shipped to Ontario for contaminants analysis. Contaminant levels will be compared to other samples collected across the country.

RESULTS AND MAIN CONCLUSIONS:

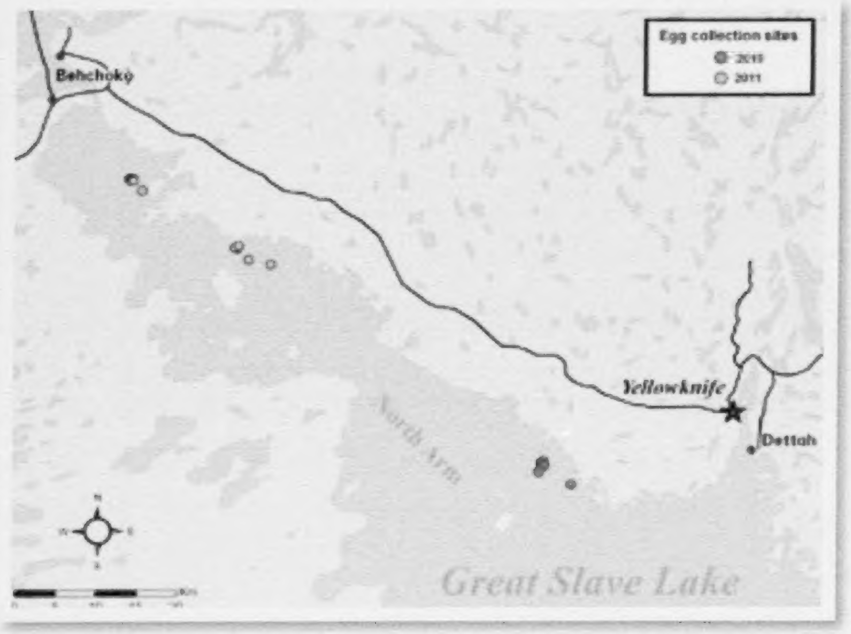
Fifteen eggs (2010) and ten eggs (2011) were collected from herring gull nests on the North Arm of Great Slave Lake. Two years of data show that levels of PFCs (chemicals like scotch guard) and flame retardants were similar to those found in island colonies on the Atlantic and Pacific coasts of Canada but were only a fraction of those found in gulls from the Great Lakes, St. Lawrence and prairie areas.

LONG-TERM PLANS AND RECOMMENDATIONS:

Plans are to continue collecting herring gull eggs for contaminants analysis on the North Arm in 2012.

Photo: M. Wasiuta Canadian Wildlife Service

Gull nest on open rock.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Annual Report of

Western NWT Biophysical Study

2011

Northwest Territories Environment and Natural Resources

Cover Photo: D. Downing

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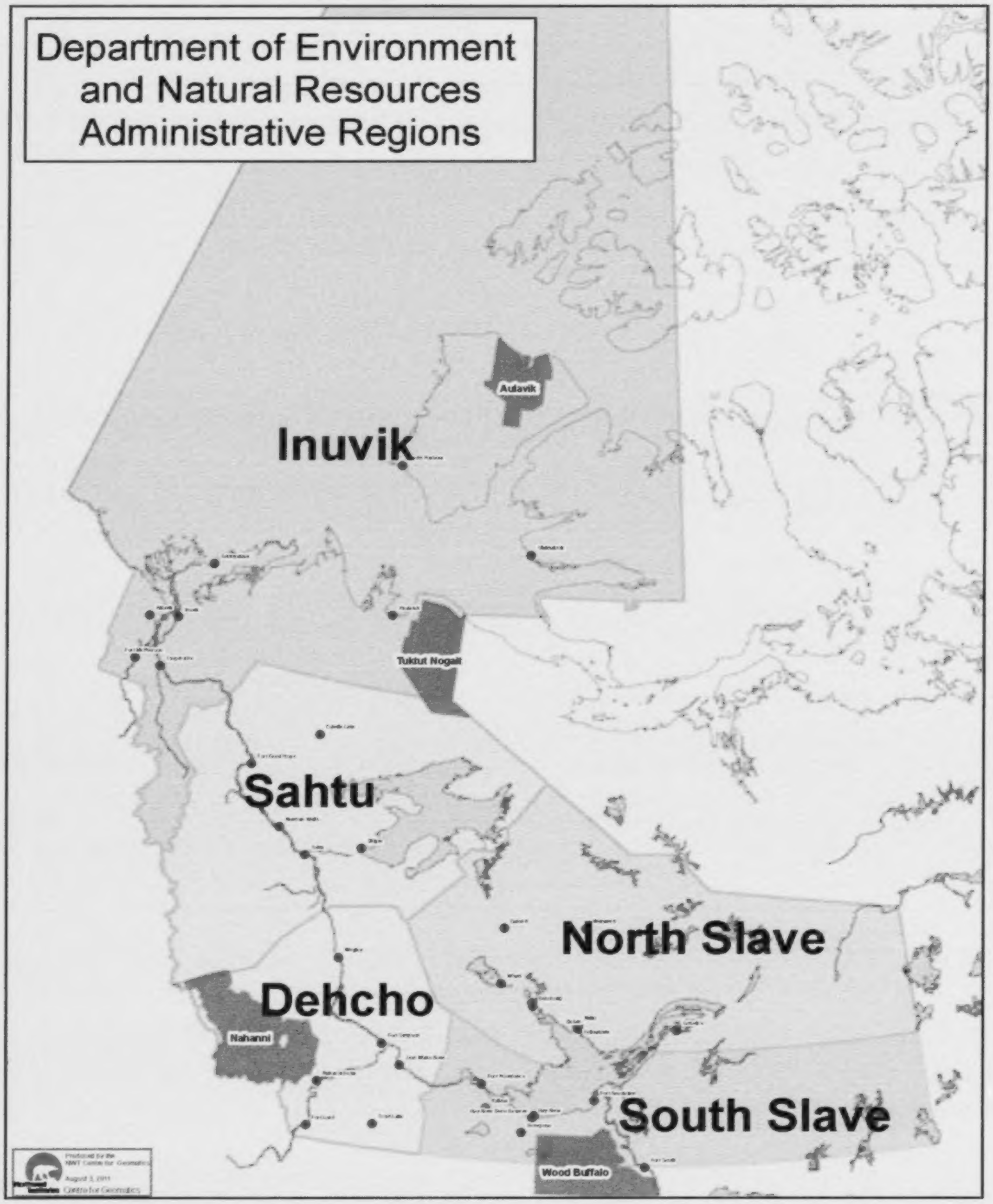

Department of Environment and Natural Resources Administrative Regions

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Tuktut Nogait
Sahtu
North Slave
Dehcho
Nahanni
South Slave
Wood Buffalo

NORTHWEST TERRITORIES

Photo: D. Downing

2011–2012
Western NWT Biophysical Study

Introduction

RATIONALE

The Western NWT Biophysical Study was established to help ensure baseline data necessary to assess, mitigate and monitor the environmental impacts of proposed developments in the Western NWT is available to industry, regulators, communities and government. The program focuses on areas within the mandate of the Department of Environment and Natural Resources (ENR): wildlife, wildlife habitat, forests and air quality.

BACKGROUND

As the primary authority responsible for managing aspects of wildlife, wildlife habitat and forests in the NWT, the former Department of Resources, Wildlife and Economic Development (RWED) initiated a multi-party process to determine what these potential impacts could be and to work to find ways to limit possible negative implications. These areas of responsibility now reside within the Department of Environment and Natural Resources (ENR), formed from the partition of RWED into the Department of Industry, Tourism and Investment (ITI) and ENR on April 1, 2005.

In early 2004, RWED in collaboration with the Department of Indian and Northern Affairs, and Environmental Studies Research Funds, completed a project to identify biophysical information and research gaps associated with hydrocarbon exploration, development, and transmission in the Mackenzie Valley. The Western NWT Biophysical Study has allowed the GNWT to initiate research projects necessary to address many of the gaps identified within ENR's mandate.

STATUS

The Western NWT Biophysical Study provided $899,950 towards projects in 2003/2004, $908,000 towards projects in 2004/2005, $894,000 towards projects in 2005/2006, $803, 500 towards projects in 2006/2007, $750,000 towards projects in 2007/2008, $637,000 towards projects in 2008/2009, $390,000 towards projects in 2009/2010, 2010/2011, and 2011/2012. In addition to research projects, workshops are held in each of the Mackenzie Valley regions to review progress of the Study and to ensure priority information needs are being addressed. Partnerships with federal agencies, wildlife management boards, universities, non-government organizations and industry have been developed on a project-by-project basis. Most projects involve multiple partners.

DISCLAIMER

This publication provides summary reports for projects carried out under the Western NWT Biophysical Study during 2011. Contact information for the main investigator leading each project has been included if you wish to obtain more information on a specific project.

The contents of each summary are the sole responsibility of the team leads and do not reflect any official policy of ENR or the GNWT.

Wynniatt Bay, Victoria Island

Boreal Woodland Caribou: Habitat and Productivity

APRIL 2011 TO MARCH 2012

MAIN INVESTIGATOR:

Marsha Branigan, Manager Wildlife Management,
Environment and Natural Resources,
GNWT, Inuvik Region

LOCATION:

Gwich'in Settlement Area.

PARTNERS:

- Environment and Natural Resources
- Gwich'in Renewable Resources Board (GRRB)

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RATIONALE:

Boreal woodland caribou are listed as Threatened under the federal *Species at Risk Act* (SARA). A national recovery strategy is being developed and the action plan for the conservation of boreal caribou in the NWT has been completed.

Prior to these studies, little scientific knowledge was available for boreal ecotype woodland caribou (*Rangifer tarandus caribou*) that occur along the Mackenzie River Valley from the NWT/Alberta border to the area of the Mackenzie Delta.

OBJECTIVES:

- Obtain estimates of home range size and seasonal movements of adult females and adult males.
- Determine patterns of habitat use and selection including use of areas burned by wildfires and use of areas in relationship to man-made linear features such as seismic lines.
- Map the relative probability of occurrence of boreal woodland caribou across the Gwich'in Settlement Area using caribou use (satellite tracking) data and existing Landsat™ based vegetation maps.
- Identify seasonal habitats that may be limiting for boreal woodland caribou in the Gwich'in Settlement Area.
- Obtain estimates of productivity, recruitment and survival (calf and adult female) rates.
- Provide baseline information on caribou ecology prior to and possibly during the construction phase of the proposed Mackenzie Gas Pipeline and compare that information with animals collared after the pipeline construction phase.

METHODS:

The number of collars was too low so no flights were conducted in 2011/2012. Collars were due to drop in August 2011. One collar continued to move after this date but is no longer functioning. GPS and satellite collars were monitored remotely throughout the year.

RESULTS AND DELIVERABLES:

No new collars were deployed in 2011.

LONG-TERM PLANS AND RECOMMENDATIONS:

Collared caribou movements will continue to be monitored until the last collars release in August 2011.

There are no plans to collar additional boreal woodland caribou in the region at this time as baseline data collection is complete.

COMMUNITY INVOLVEMENT:

Assistants are hired from local communities of Inuvik and Tsiigehtchic when flights are conducted. Results presented to GRRB and Renewable Resources Councils (RRCs).

Photo: T. Davidson

Monitoring overwinter calf survival gives an estimate of recruitment of new animals into a herd which is important for determining the potential for herd growth in the future.

Boreal Caribou Monitoring: Hay River Lowlands (Ka'a'gee Tu Candidate Protected Area) and Cameron Hills

2011 TO 2012

MAIN INVESTIGATOR:

Allicia Kelly, Regional Biologist,
Environment and Natural Resources,
GNWT, South Slave Region

LOCATION:

The combined study area (Hay River Lowlands and Cameron Hills) is bounded by Hay River to the east, the Mackenzie River and Great Slave Lake to the north, the Redknife and Kakisa Rivers to the west and the Hay River to the south.

PARTNERS:

- Environment and Natural Resources
- Fort Providence Resource Management Board
- Ka'a'gee Tu First Nation
- K'atl'odeeche First Nation
- NWT Métis Nation

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RATIONALE:

Boreal caribou monitoring is required to determine if these ranges are providing sustainable habitat for boreal caribou, to understand how boreal caribou respond to development, climate change and other pressures, and to make effective management decisions that will conserve boreal caribou for future generations. This study has been ongoing since 2003 and has provided valuable information on boreal caribou population demographics, condition, and habitat selection in South Slave Region. Monitoring was very limited in 2011-12 due to very few collared cows in this area and postponed funding.

OBJECTIVES:

- Monitor population demographics: adult female survival, calf production, ten-month calf recruitment, and finite rate of population increase (the relative change in size of population from one year to the next);
- Document seasonal range use, annual home ranges and fidelity to calving areas (whether cows use the same area to calve year after year); and
- Examine boreal caribou habitat use and selection in relation to natural and human caused disturbance (e.g. wildfire, development) and landscape features (e.g. forest type).

METHODS AND INFORMATION COLLECTED:

Monitoring was very limited in 2011-12 due to very few collared cows in this area and postponed funding. GPS collars are programmed to collect 3 locations per day, 365 days/year.

As of April 1, 2011, in the Hay River Lowlands study area, there were two active GPS collars and six active VHF collars. The two GPS collars released in July 2011 and were retrieved in August 2011.

As of February 2011, four of the six VHF collared caribou were still alive. Three of the remaining VHF collars are scheduled to drop in June 2012 and one is scheduled to drop in April 2013.

As of April 1, 2011, in the Cameron Hills area, there were two active GPS collars managed by the NWT. Both collars released in July 2011 and were retrieved in August 2011.

A recruitment survey was not conducted in March 2012 because there were too few collars to assist with locating groups of caribou to classify, and to calculate cow survival (needed to calculate lambda and population trend).

RESULTS AND DELIVERABLES:

A paper that included collar data from this program was published in *Ecological Applications* 21: 2334-2348 "Subpopulation structure of caribou (*Rangifer tarandus* L.) in arctic and sub-arctic Canada" (Nagy et al. 2011).

A poster presentation was made at the 13th Arctic Ungulate Conference in August 2011 (Yellowknife, NWT).

LONG-TERM PLANS AND RECOMMENDATIONS:

Future monitoring will focus on boreal caribou habitat north of the Cameron Hills. We recommend that monitoring of boreal caribou continue with a minimum of 25 collared cows in the study area (deployed in February 2013). Caribou movement and location data also provides valuable data on how caribou use the habitat available to them. Meetings will be held with partners to discuss additional program priorities and share information.

Photo: D. Allaire

A collared female
in the rear of a small group.

Seasonal Range Use and Movement Patterns of Boreal Caribou in the Dehcho

2011 TO 2012

MAIN INVESTIGATOR:

Nic Larter, Regional Biologist,
Environment and Natural Resources,
GNWT, Dehcho Region

LOCATION:

The study area includes both the south central and north central portions of the Dehcho, roughly bounded to the north by Blackwater Lake, to the south by the 60th parallel, to the east by the Redknife Hills (south) and the Horn Plateau (north), and to the west by the Liard Highway 7 (south) and the Mackenzie River (north). Caribou collared in this area do not respect these arbitrary borders.

PARTNERS:

- Environment and Natural Resources
- Sambaa K'e Dene Band
- Nahanni Butte Dene Band
- Jean Marie River First Nation
- Fort Simpson Métis Local
- Łíídlı̨ı̨ Kų́ę́ First Nation
- Pehdzeh Ki First Nation
- Acho Dene Koe First Nation
- Ka'a'gee Tu First Nation

RATIONALE:

Boreal caribou are listed as Threatened in Canada under the federal *Species at Risk Act*. The cumulative effects of natural and man-made disturbance have been implicated in the declining numbers of this species. Similar studies were initiated during 2002-2004 throughout the range of boreal caribou in the NWT including the Inuvik, Sahtu, South Slave and Dehcho regions.

In partnership with Sambaa K'e Dene Band, ENR initiated this study in March 2004 by deploying radio collars on caribou in the Sambaa K'e traditional lands. The main study goal was to assess the basic ecology of boreal caribou and collect baseline data on caribou inhabiting areas subjected to limited human disturbance. In partnership with Łíídlı̨ı̨ Kų́ę́ First Nation and the Fort Simpson Métis, ENR extended the study in March 2005 when radio collars were deployed on caribou in the Ebbutt Hills area.

Preliminary DNA analyses indicated that the historical gene flow of boreal caribou in the NWT occurred in both a north-south and east-west direction. Boreal caribou residing in the central Dehcho provided an opportunity to collect key genetic data on historical gene flow corridors of boreal caribou and to collect important ecological baseline data in an area of their range that already has one pipeline traversing it and falls within the proposed route of the Mackenzie Gas Pipeline.

With the success of the initial deployments of collars in 2004 and 2005 there was interest by other Dehcho First Nations in having collars deployed in their traditional lands. Following community consultations deployments in 2006, 2007, 2008, 2009, 2010, and 2012 included caribou residing in the traditional lands of Jean Marie River First Nation, Pehdzeh Ki First Nation, Nahanni Butte Dene Band, Acho Dene Koe Band and Ka'a'gee Tu First Nation.

OBJECTIVES:

- To ensure an adequate sample size of functioning collars on female boreal caribou during the calving period for monitoring population demographics;
- To provide baseline information on caribou ecology prior to the construction phase of the proposed Mackenzie Gas Pipeline and possibly during the construction phase and provide the opportunity to compare with animals collared after the pipeline construction phase;
- To provide baseline information on caribou ecology in the Arrowhead area prior to additional industrial exploration and activity;
- To ensure enough collars are deployed on female caribou to document seasonal movements of female caribou over multiple years thus permitting us to assess the fidelity in seasonal movements and range use over a maximum four year period;
- To document calving events, annual calving periods, and fidelity to calving areas;
- To collect detailed daily movements of individual females residing throughout the study area over a minimum three year period;
- To provide annual estimates of calf production, late-winter female:calf ratios, adult female survival and population rate of increase;
- To provide additional ecological data on boreal caribou as part of the requirements for procuring Protected Area Status for lands of interest in the Trout Lake, Wrigley, Jean Marie River and Kakisa areas; and
- To provide ecological data on boreal caribou to the Dehcho Boreal Caribou Working Group.

METHODS AND INFORMATION COLLECTED:

Collars were deployed on 16 female caribou throughout the Dehcho in February and March, 2012.

Blood samples were tested for serum progesterone levels.

Fecal samples were analyzed for the presence of various diseases and parasites.

Daily satellite location data were received, entered into a database, and analyzed as required.

Some collars were retrieved from animals that had died in previous years. All retrieved collars were refurbished and redeployed in February and March, 2012.

Calving events were determined for all collared females based upon analysis of their daily movements.

A survey was conducted in March 2012 to document the number of collared females still with calves of the year and to classify all caribou observed into different sex/age groups.

RESULTS AND DELIVERABLES:

Posters showing caribou ranges over a three-month period are produced quarterly and distributed to First Nation partners on an ongoing basis.

Community meetings and consultation are conducted annually on an ongoing basis.

Survey results have been circulated to all First Nation partners.

The lab analyses of biological samples are ongoing and supplement the results published in the *Journal of Wildlife Diseases* volume 46: 1096-1107 "Serum biochemistry, serology, and parasitology of boreal caribou (*Rangifer tarandus caribou*) in the Northwest Territories, Canada" (Johnson et al. 2010).

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The Dehcho Boreal Caribou Progress Report (April 2012) was circulated to all partners and is posted on the ENR website.

Location data from this study was incorporated into a publication "Subpopulation structure of caribou (*Rangifer tarandus* L.) in Arctic and sub-Arctic Canada." by J.A. Nagy et al., (*Ecological Applications* 21: 2334-2348). Additional scientific publications from this analysis are being prepared.

Data from this study are provided to the Dehcho Boreal Caribou Working Group when requested.

LONG-TERM PLANS AND RECOMMENDATIONS:

Monitoring population demographics by the use of collars should remain ongoing.

Flights to retrieve collars should be made whenever the opportunity arises.

All retrieved satellite and GPS collars should be refurbished for re-deployment.

All satellite collars retrieved will be programmed so they can determine calving events, thus eliminating the need for June surveys of calf production.

We encourage harvesters to return any collar from a harvested animal.

Keeping as many GPS collars active as possible in the study is preferable, hence when additional collars need to be purchased they should be GPS collars.

Aerial surveys to determine calving have been discontinued because location data can be used to determine calving events and locations.

Meetings to discuss the caribou program with our partners will be ongoing.

At the upcoming Dehcho Regional Wildlife Workshop (October 2012) the program will be reviewed and critiqued by representatives from all Dehcho First Nations.

Continued annual deployment of collars to maintain a minimum of 30 active collars during the calving period.

Information from this study has been and will continue to be provided to the Dehcho Boreal Caribou Working Group as an essential part of the working group's mandate.

COMMUNITY INVOLVEMENT:

At annual community meetings and biannual regional wildlife workshops the caribou program is discussed in an open forum format. Community issues and concerns are addressed and collar deployment takes direction from these meetings. An annual application for wildlife research permitting provides additional avenues for community input. Local residents have participated in collar retrievals and in aerial reconnaissance flights when and if recommended by local First Nations. Because we all want to minimize animal harassment, collar deployment is contracted out to a professional team. Community members sit on the Dehcho Boreal Caribou Working Group. As part of its mandate the group not only solicits information from this study but also provides recommendations for this study.

Caribou Management Planning: Cape Bathurst, Bluenose-West and Bluenose-East Herds

APRIL 2011 TO MARCH 2012

MAIN INVESTIGATOR:

Marsha Branigan, Manager Wildlife Management,
Environment and Natural Resources,
GNWT, Inuvik Region

LOCATION:

Gwich'in Settlement Area and Inuvialuit Settlement Region.

PARTNERS:

- Environment and Natural Resources
- Gwich'in Renewable Resources Board
- Inuvialuit Game Council
- Wildlife Management Advisory Council (NWT)
- Advisory Committee for the Cooperation of Wildlife Management

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RATIONALE:

This project was developed to try to ensure a cooperative management system for the Cape Bathurst, Bluenose-East and Bluenose-West herds was in place prior to any significant development in the area. These herds range across multiple jurisdictions and coordination is essential.

OBJECTIVES:

- To collect comments and concerns to inform the management planning process for the herds that range within the development area.

METHODS AND INFORMATION COLLECTED:

The draft plan was released for comment by the Advisory Committee for the Cooperation on Wildlife Management (ACCWM). The Department of Environment and Natural Resources (ENR) held a public meeting in Inuvik to collect comments. All stakeholders, including companies operating in the development area, were invited to attend and comment on the draft plan. Meetings were also held in Tsiigehtchic, Fort McPherson, Aklavik and Inuvik in cooperation with the Gwich'in Renewable Resources Board (GRRB) and the local RRCs.

RESULTS AND DELIVERABLES:

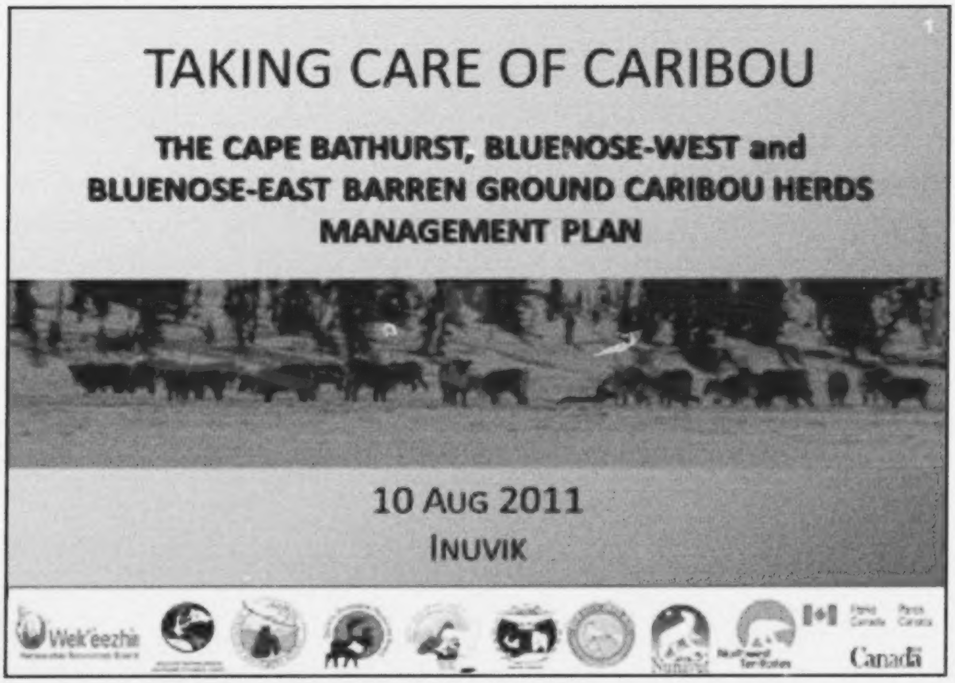
Public meetings held and draft plan distributed for comments. Magnets and other communication materials were also distributed.

LONG-TERM PLANS AND RECOMMENDATIONS:

To have a recommended plan for the herds from the ACCWM for long term management of the range and herds.

COMMUNITY INVOLVEMENT:

Meeting announcements were sent to the Gwich'in Renewable Resources Board (GRRB), Renewable Resource Councils (RRCs), Wildlife Management Advisory Council (NWT), Inuvialuit Game Council and Hunters and Trappers Committees.



TAKING CARE OF CARIBOU

THE CAPE BATHURST, BLUENOSE-WEST and BLUENOSE-EAST BARREN GROUND CARIBOU HERDS MANAGEMENT PLAN

10 AUG 2011
INUVIK

Cover of the Caribou Management plan document.

Population Dynamics, Physical Condition, Seasonal Movements, Health, Contaminants and Harvest of Barren-ground Caribou - CLS

2011 TO 2012

MAIN INVESTIGATOR:

Richard Popko, Supervisor, Wildlife Management,
Environment and Natural Resources,
GNWT, Sahtu Region

LOCATION:

Sahtu Settlement region.

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RATIONALE:

Radio collars have been deployed on Bluenose-West and Bluenose-East caribou since the early 1980s. The use of satellite and GPS tracked radio collars began in 1995. The data received from these collars is integral to wildlife management decisions.

OBJECTIVES:

- Barren-ground caribou are fitted with satellite or GPS tracked radio collars for several reasons. The location information received from these collars can be used to analyze habitat use, seasonal ranges, migration routes as well as timing of migration. The information can also be useful for environmental assessments, helping to reduce the potential impacts of disturbance (such as mineral or oil and gas exploration). During aerial surveys the radio collars help to locate caribou, and locations are essential for post-calving aerial survey estimates of herd size.

METHODS AND INFORMATION COLLECTED:

Collars were deployed on Bluenose-West and Bluenose-East caribou according to the Environment and Natural Resources (ENR) NWT Wildlife Care Committee applications. Collars were both GPS and satellite collars. Information from these collars is downloaded regularly.

RESULTS AND DELIVERABLES:

All locations received from the radio collars are downloaded and archived in the Wildlife Management Information System (WMIS).

LONG-TERM PLANS AND RECOMMENDATIONS:

In the spring of 2012, 59 new satellite and GPS tracked radio collars were deployed on Bluenose-West caribou and 60 new satellite and GPS-tracked radio collars were deployed on Bluenose-East caribou.

Photo: R. Popko

During aerial surveys the radio collars help to locate caribou. The location information is essential for the post-calving aerial survey that estimates herd size.

Bluenose-West
Overwinter Calf Survival

2011 TO 2012

MAIN INVESTIGATOR:

Richard Popko, Supervisor, Wildlife,
Environment and Natural Resources,
GNWT Sahtu Region

LOCATION:

Sahtu Settlement Area.

PARTNERS:

- Members of the Behdzi Ahda First Nation assisted the survey by caching fuel and serving as observers during the survey.
- Environment and Natural Resources (funding)

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RATIONALE:

Monitoring overwinter calf survival gives an estimate of recruitment of new animals into a herd, which is important for determining the potential for herd growth in the future.

OBJECTIVES:

- To estimate recruitment for the Bluenose West caribou herd in late winter by the number of calves per 100 cows.

METHODS AND INFORMATION COLLECTED:

This survey was based out of Colville Lake using a Bell 206 Long Ranger helicopter. Groups of Bluenose-West caribou were located using radio collar locations, tracking and spotting. Two biologists classified all caribou from the front seat of the aircraft as cows, calves and bulls. Recruitment was estimated as the number of calves per 100 cows.

RESULTS AND DELIVERABLES:

Over three days 2,807 caribou were classified.
The resulting calf:cow ratio was 32 per 100.

LONG-TERM PLANS AND RECOMMENDATIONS:

The late winter recruitment survey is an important indicator of population status and is planned to continue on an annual basis.

Photo: J. Nagy

Caribou surveyed on the tundra

CLS America Data Acquisition (Caribou and Bear)

APRIL 2011 TO MARCH 2012

MAIN INVESTIGATOR:

Marsha Branigan, Manager Wildlife Management,
Environment and Natural Resources,
GNWT, Inuvik Region

LOCATION:

Gwich'in Settlement Area and
Inuvialuit Settlement Region.

PARTNERS:

- Environment and Natural Resources
- Gwich'in Renewable Resource Board
- Inuvialuit Game Council
- Wildlife Management Advisory Council (NWT)

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RATIONALE:

This study was established to help ensure that baseline data necessary to assess, mitigate and monitor the environmental impacts of proposed developments in the Western NWT is available to industry, regulators, communities and government.

OBJECTIVES:

- Collect baseline data for boreal woodland caribou, barren-ground caribou and grizzly bear movements in the development area.

METHODS AND INFORMATION COLLECTED:

Collars were deployed on the species as set by the Environment and Natural Resources (ENR) (NWT) Wildlife Care Committee (WCC) applications. Collars were both GPS and satellite collars.

RESULTS AND DELIVERABLES:

Movements from collared boreal woodland and barren-ground caribou, and grizzly bear were monitored and archived in the Wildlife Management Information System (WMIS). Collared boreal woodland caribou were monitored until last planned collar release date of August 2011. There are no plans to collar additional boreal woodland caribou in the region.

LONG-TERM PLANS AND RECOMMENDATIONS:

GPS collars deployed on grizzly bears have all dropped off. Collection of baseline data is considered complete and data is being analyzed as part of thesis projects of several students and within ENR.

ENR plans to continue to monitor barren-ground caribou movements. Additional caribou collars were deployed in March 2012.

COMMUNITY INVOLVEMENT:
Assistants are hired from local communities of Inuvik and Tsiigehtchic. Results presented to Gwich'in Renewable Resources Board (GRRB), Renewable Resource Councils (RRCs), Wildlife Management Advisory Council (NWT), Inuvialuit Game Council and Hunters and Trappers Committees.

Barren-ground caribou forage for food on the tundra.

Photo: A. Gunn

Dehcho Moose Population Monitoring

2011 TO 2012

MAIN INVESTIGATOR:

Nic Larter, Regional Biologist,
Environment and Natural Resources,
GNWT, Dehcho Region

LOCATION:

The large-scale aerial survey areas include the Mackenzie River Valley and adjacent area and Liard River Valley and adjacent area. Biological samples come from traditional harvesting areas of members of local Dehcho First Nations which include NE British Columbia.

PARTNERS:

- Environment and Natural Resources
- Dehcho First Nations
- Previous funding from Northern Contaminants Program and Parks Canada.

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RATIONALE:

Moose is an important traditional wildlife resource for residents of the Dehcho region of the Northwest Territories (NWT). Moose density estimates for areas within and adjacent to major harvesting corridors and current and proposed industrial development were lacking. Limited moose surveys were conducted in the Dehcho in the mid 1980s in relation to the new Liard Highway. One survey was conducted in the Liard Valley in 1994. Moose in the Dehcho continue to be a highly sought after traditional food by both local residents and hunters residing in other regions of the NWT. Hunting pressure on moose has increased since the last surveys especially with the restrictions recently placed on barren-ground caribou harvesting. Local First Nations throughout the Dehcho region have voiced their concerns about the impact on moose numbers. These concerns, combined with increasing oil and gas activity in the Liard and Mackenzie River Valleys, indicated a need to assess moose populations prior to additional habitat loss and increased accessibility in the region. Being an important traditional food source, residents of the Dehcho also wanted to know what the health and condition was of the moose they harvested for food, and whether it was changing over time.

OBJECTIVES:

- To establish baseline estimates of moose density in the Dehcho region and establish a community-based monitoring program of harvested moose;
- To conduct small-scale aerial surveys for moose in areas of interest to five communities in the Dehcho region at an appropriate frequency between large-scale surveys. Surveys would be conducted with the assistance of local harvesters as observers over a multi-year period;

- To provide information that can be used to determine the timing of further large-scale and small-scale moose monitoring surveys in the region;
- To document health and condition indices of locally harvested moose throughout the region and increase community involvement in harvesting programs;
- To document incidences of disease and parasites in locally harvested moose; and
- To document the levels of various heavy metals and other contaminants found in the organs of moose harvested as a country food source throughout the Dehcho region.

METHODS AND INFORMATION COLLECTED:

Traditional knowledge was used to stratify the air survey areas into high and low moose density areas.

The ver Hoef geospatial method was used for large-scale moose surveys flown in the Mackenzie River Valley (November 2003) and the Liard River Valley (February 2004).

Based on traditional knowledge and these new sources of information, an annual moose monitoring program was initiated with five communities in the Dehcho region (Wrigley, Fort Simpson, Jean Marie River, Nahanni Butte, and Fort Liard).

The monitoring program consists of an aerial survey component (conducted in November) to assess moose distribution, density and calf production and a biological sampling program component to physically assess animal health and condition.

Biological sampling has allowed for the documentation of the incidence of parasites and disease and the documentation of levels of various contaminants in moose organs.

Sampling protocols have been discussed with harvesters and sampling kits are provided to harvesters in all five communities.

In November 2011 a large-scale moose survey of the Mackenzie and Liard River Valleys was conducted using the ver Hoef geospatial method.

Prior to the survey traditional and previous survey knowledge was used to delineate the strata and to modify the survey area somewhat from that used in 2003/04.

From 14-22 November, 188 survey blocks (of *ca.* 16km^2) were flown and all moose, and other wildlife, found within these blocks was counted.

RESULTS AND DELIVERABLES:

Preliminary results, posters and summary reports have been provided to First Nations.

Preliminary results were used in the decision for a public health advisory on the consumption of moose organs and published in *Circumpolar Health Suppl.* 2010; 7: 351-355.

A presentation of the entire moose monitoring program was made at the 6th International Moose Symposium and was published in *ALCES* Vol. 45:88-99.

A plain language poster on the level of cadmium found in moose meat and cigarettes was distributed before the 2010 fall hunt.

A presentation with further updates of the program will be presented at the 7th International Moose Symposium in August 2012.

Results of the November 2011 survey will be presented at the Dehcho Regional Wildlife Workshop in October 2012; 299 moose were observed during the survey, not all within survey blocks.

Scientific publications and government reports of additional results are currently being produced and will be presented in a variety of formats and forums.

LONG-TERM PLANS AND RECOMMENDATIONS:

Based upon the results of the large-scale surveys completed in winter 2003 and winter 2011, it is recommended that large-scale surveys be completed on a six year rotation and that smaller scale monitoring surveys are conducted once every two years between the large-scale surveys.

We continue to work on a thorough statistical analysis of contaminant results from moose organs, after receiving unanticipated analyses of banked organ samples.

The program collecting biological samples including organs should be revisited over the next few years since it is five years since the contaminant levels were measured from harvested moose. There is a need to determine whether current levels are similar to those reported previously.

All biological samples collected will be stored frozen for future analyses.

COMMUNITY INVOLVEMENT:

At annual community meetings and regional biannual wildlife workshops, the current status of the moose program is presented and critiqued in an open forum setting. Community concerns are raised and addressed at such meetings and the program is modified accordingly.

Photo: D. Allaire

Observers participate in transect surveys.

Photo: N. Larter

A bull moose shedding the velvet from his antlers.

Mountain Goat Surveys in Southern Mackenzie

2011 TO 2012

MAIN INVESTIGATOR:

Nic Larter, Regional Biologist,
Environment and Natural Resources,
GNWT, Dehcho Region

LOCATION:

We conducted an aerial survey for mountain goat *(Oreamnos americanus)* in the Ragged Range area of the southern Mackenzie Mountains. The area surveyed covered *ca.* 1,700 km^2 and was bounded by 62° 16'N and 61° 45'N to the north and south and 127° 20'W and 128° 20'W to the east and west, which is much of the Ragged Range, between the Flat and North Nahanni river valleys bisected by the Rabbitkettle River.

PARTNERS:

- Environment and Natural Resources
- South Nahanni Outfitters

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RATIONALE:

Information on the status of mountain goats in the Mackenzie Mountains is extremely outdated, contains limited harvest information, provides erroneous information on goat distribution and provides population estimates that are not based on any type of repeatable survey methodology. Recently Environment and Natural Resources (ENR) Fort Simpson collaborated with outfitters in the Mackenzie Mountains to conduct repeatable aerial surveys and improve information on the distribution of goats in the southern Mackenzie Mountains. With the recent increase in popularity of guided hunts for mountain goat and an increased annual harvest, it is important that there is appropriate baseline goat population data with which to evaluate the recent changes in harvest levels. This is particularly important now with the expansion of Nahanni National Park Reserve into some areas of goat distribution. The Mackenzie Mountains represent one of the largest areas of contiguous goat habitat, with extremely limited development and currently has a low level of harvest. There is the potential for this area to become a more popular destination for goat hunters. The Mackenzie Mountains is already a popular destination for a high quality hunting experience and hunters and outfitters provide a substantial economic benefit to individuals, businesses and the Government of the Northwest Territories (GNWT).

OBJECTIVES:

- To conduct an aerial survey, with a repeatable methodology, in an area of known mountain goat range that had not been previously surveyed;
- To document the number of animals in various sex and age classes within the survey area; and
- To work cooperatively with members of the Association of Mackenzie Mountain Outfitters to update information on the number and distribution of mountain goat in the southern Mackenzie Mountains.

METHODS AND INFORMATION COLLECTED:

From 22-24 August, 2011, we flew six survey legs into different parts of the study area.

We used a Bell 206B rotary aircraft. Observers with binoculars were in the front passenger and rear passenger seats.

We employed a spaghetti transect technique flying up and down alpine valleys thoroughly searching peaks, ridge lines, cliff faces, and cirque basins.

A GPS was used to track the flight path and to waypoint all goats and other wildlife observed.

Survey legs were kept to two hours or less in duration and were flown in the mornings or early evenings when goats are more active and/or visibility is enhanced by the lighting; no flights were conducted during the afternoon heat of the day.

We classified goats as billies, nannies, yearlings and kids whenever possible.

RESULTS AND DELIVERABLES:

We observed 144 groups of mountain goats totaling 278 individuals, being unable to classify only 18 animals.

We classified 124 billies, 80 nannies, 50 kids, and 6 yearlings.

We estimated 62.5 kids: 100 nannies, and 155 billies: 100 nannies.

GNWT Manuscript Report 212 provides more details of the survey and can be found on the ENR website: www.enr.gov.nt.ca/_live/documents/content/212_manuscript.pdf

The results of this survey will be used with other more recent aerial surveys for goats in other parts of the southern Mackenzie Mountains to update the information on the current status of mountain goats in the Northwest Territories.

LONG-TERM PLANS AND RECOMMENDATIONS:

Continue to collect information on the number and distribution of mountain goats in other parts of their range.

Compile the current information on mountain goat numbers, distribution, and harvest and produce an updated status report on mountain goat in the Northwest Territories.

Continue to collect sex and age information, DNA samples and any other biological samples from harvested goats to improve our knowledge on other aspects of mountain goat ecology, especially in relation to the levels of various heavy metals found in goat tissues.

COMMUNITY INVOLVEMENT:

Because this was an aerial survey being completed in cooperation with South Nahanni Outfitters, there was limited opportunity for community involvement.

Mountain goat has extremely limited community interest.

Moose Population Surveys in the South Slave

2011 TO 2012

MAIN INVESTIGATOR:

Allicia Kelly, Regional Biologist,
Environment and Natural Resources,
GNWT, South Slave Region

Refer to Wildlife Research Permit WL004826 found on page 62 of the 2011 Annual Report of NWT Wildlife Research Permits.

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Biophysical studies completed in the Inuvik region:

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